



**UNIVERSITY of the  
WESTERN CAPE**

**Gendered Dynamics in South African Astrophysics: A Case  
Study of the South African Astronomical Observatory**

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**A mini-thesis submitted in partial fulfillment of the requirements for Master of Arts  
Degree in the Department of Women's and Gender Studies, University of the  
Western Cape**

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## Declaration

I declare that “**Gendered Dynamics in South African Astrophysics: A case study of the South African Astronomical Observatory (SAAO)**” is my own work, that it has not been submitted for any degree or examination at any other university and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

**Full name:** Thembelihle Bongwana

**Date:** 30/11/ 2016

**Signature**



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## **Abstract**

This study explores the nuances around gendered dynamics, attitudes, ideologies, values and knowledge that exist within astronomy and astrophysics institutions paying specific attention to the South African Astronomical Observatory (SAAO) as study site. This study investigated implicit and explicit ways in which SAAO spaces and practices are gendered and hierarchized, and the extent to which 'astronomy as a specific discipline within science' remains highly masculinized. By focusing on studies on power, feminist critiques of science and institutional culture in other South African sectors, especially higher education, the study deconstructs a field that has been relatively neglected in South African feminist studies of gendered institutional culture. This thesis makes use of feminist qualitative methodological approaches and fuses mixed methods to collect data. The use of participant observation enabled a broader understanding of the context and to gain an understanding of how gendered, classed and raced subjects construct and navigate social meanings in the hierarchized and symbolically marked space of the SAAO.

## Key Words

**Keywords:** Gender and Science, Gender and Astrophysics, Gendered Institutions, Gender Dynamics, Institutional Culture, Institutional Hierarchies, Power Dynamics, Feminist Research, South African Astronomical Observatory.



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## Abbreviations

<b>SAAO</b>	South African Astronomical Observatory
<b>NASSP</b>	National Astrophysics and Space Science Programme
<b>SALT</b>	Square Kilometre Array
<b>SARChI</b>	South African Research Chairs Initiative
<b>NRF</b>	National Research Foundation
<b>BCEA</b>	Basic Conditions of Employment Act
<b>STEM</b>	Science, Technology, Engineering and Mathematics
<b>UCT</b>	University of Cape Town
<b>WITS</b>	University of the Witwatersrand
<b>NMMU</b>	Nelson Mandela Metropolitan University
<b>TUT</b>	Tshwane University of Technology
<b>UKZN</b>	University of Kwa-Zulu Natal
<b>NEPI</b>	National Education Policy Investigation
<b>PSE</b>	Post-Secondary Education
<b>DHET</b>	Department of Higher Education and Training
<b>DST</b>	Department of Science and Technology
<b>CHE</b>	The South African Council on Higher Education
<b>WISA</b>	Women in Science Awards
<b>NASSP</b>	National Astrophysics and Space Science Programme
<b>DoE</b>	Department of Education
<b>HE</b>	Higher Education
<b>FMF</b>	Fees Must Fall
<b>HBI</b>	Historically Black Institutions



**HWI**

Historically White Institutions

**Wisat**

Women in Global Science and Technology



## CHAPTER ONE

### Introduction

The study of gender and science calls for an immediate unpacking of the parameters of these independent terms. One aspect of this unpacking involves theorizing gender in a field (the natural sciences) that is often considered to be neutral and not amenable to constructionist investigation. As will be shown, analyzing gender does not only involve investigating women's roles and statuses relative to men's. It also entails understanding how particular knowledges and academic disciplines and research sites have acquired particular gendered characteristics, and the role that these play in creating or maintaining power and forms of exclusion and marginalization.

A related aim of unpacking "gender" and "science" is to highlight the discourses and power relations on which the evolution of astrophysics - as an authoritative area within science - has been based, with particular reference to the complex dynamics within the South African Astronomical Observatory (SAAO). Although scientific fields seem to revolve around what is factual, empirically verifiable and objective, it will be shown that they often set in place values, norms and standards that are socially constructed and, especially, gendered.

The research fields of science/astronomy/ astrophysics and gender studies are clearly distinct and disconnected, and this research does not in any way presume to 'un-science' the sciences or make claims to explore the field of astrophysics according to its positivist and technical assumptions or frameworks. However the conceptual and theoretical tools

of gender studies are what this thesis makes use of in order to uncover critical silences and power dynamics that work to reproduce patterns of exclusion and dominance. The power relations created and normalized in this field involve divides between men and women, men and men, white and black, between the working class and the elites. Power relations are also manifested in forms of knowledge, institutional cultures and physical spaces that indirectly elevate certain vantage points at the expense of others.

In thinking and writing critically about the South African Astronomical Observatory (SAAO) as a gendered institution with insurmountable inequalities and imbalances, it is imperative to begin by offering a comprehensive understanding of gender and its manifestation in various social relations and ideological systems. This chapter focuses on aspects of feminist analysis, and considers the ways in which I bring the insights of feminist studies to bear on the field of science, and astronomy and the SAAO in particular. I start the chapter by focusing on three areas within gender and feminist studies that will help in shaping my analysis; Intersectionality, Gender as learned/socially constructed and Gender as an Ideology. I go on to identify the ways in which masculinist institutional cultures, and the SAAO especially, are influenced by these areas revealing power relations. I then summarize my overall theoretical framework by identifying the theoretical and conceptual models through which I approach socially constructed identities, organizational environments and values more broadly.

## Intersectionality

'Gender' is not something that is inherited or acquired in isolation from other identities. It is constructed in the context of class, race and other factors which are interpreted through space and time. By space and time, I refer to different geographical contexts and histories that lead to gendered experiences and statuses being defined and experienced in particular ways. Chodorow defines gender as a constructed, reflective process (Chodorow, 2002). Chodorow further argues that, even 'gender difference' is psychologically and socially constructed and situated in a myriad of other categories of class, race, ethnicity etc. and this what is understood as intersectionality approach.

Though this approach was first coined by Kimberlé Crenshaw (1991) in 1989 as a valuable way of conceptualizing enmeshed multiple identities and illustrating how various social categories inform one's identity are all interrelated or connected, her theory has become increasingly influential. Due to its enduring and timeless relevance, some feminist scholars that draw and extend on Crenshaw's concept include Patricia Collins (2000), Yuval-Davis (2006), Anna Carastathis (2014), and Desiree Lewis (2015).

Intersectionality theory is premised on the notion that gender and aspects of identification such as race and class can never be studied independently from one another as they jointly play a role in determining individuals' power in relation to others, and individuals' overall subject-positioning. As a research paradigm, intersectionality is a way of conceptualizing relations between systems of oppression which take part in the formation of our multiple identities and social locations in hierarchies of power and privilege (Carastathis, 2014)

Yuval-Davis (2006) defines the notion of intersectionality as the distinctive analytical levels of identity and their relations to one another. These encompass intersecting social divisions used for political, legal and policy purposes. Davis argues that social divisions stem from different ontological positions, and that, being oppressed is socially constructed and tangled with other social divisions. The value of intersectionality is paramount in this study in theorizing women's oppression. As will be shown, women are affected not only by gendered oppression, but also by forms of oppression linked to race, class and colonialism.

Collins (2000) specifically focuses on knowledge production within academia and defines intersectionality as a formation and fusion of social identities (race, class, gender, sexuality) which work together to create inequality or a system of oppression. Collins refers to this system of oppression as the "matrix of domination" where oppression operates in three tiers, at an individualistic level, a group level and an institutional level which are then holistically infused in the experiences of those that are outside the margins of privilege and power.

Intersectionality exposes how lives intersect with a plurality of power formations, historical encounters and individual experiences across different groups in space and time (Bakare-Yusuf, 2003) in intra-group and racial dynamics. The SAAO is characterized by multiple forms of power based on complex historical processes that have been preserved and modified over time. The intersectional approach will therefore shed light on how women working in this space face multiple disempowering barriers due to

historical and systematic forms of power, as well as the more recognizable forms such as race, age, language, culture and class.

Addressing intersectionality is therefore crucial to deconstructing the layered hierarchies and power relations in organizations or institutions where the world of “work” inevitably reflects people’s social origins, their social status and their learned attitudes, as well as the social meanings entrenched in working environments. The SAAO is part of a bigger knowledge producing economy alongside universities where hierarchies are produced, reproduced and power maintained and reproduced along an axis of privilege which only distribute along racial and classist lines.

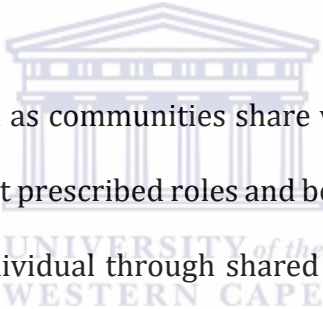
### **Gender as Learned/Socially Constructed**

Gender is acquired through socialization and learned behaviour; it is neither normal nor natural and biological. The distinction between gender and sex/ biology needs to be examined to highlight the inaccuracies that result from the flawed influences of biological determinism, especially in the natural sciences. Understanding that gender is constructed is crucially important for feminist studies that question natural science accounts of “provable” and measurable gender differences.

Both early and recent feminist constructionism studies by De Beauvoir (2009), Deutsch (2007), Butler (1988;2004) and Lorber (1994) demonstrate that, analysing gender as an oppressive and patriarchal marker of identity should look at the history or early teachings of socialization as a basis for understanding how gender is entrenched at the

macro levels of the community. They also stress that the experience of being gendered is often inscribed into various institutions one becomes a part of.

According to Butler, identity is something that is performed, thereby rendering roles as 'performative'. Gender is constructed in the acts we undertake and that are then interpreted as one's identity. Therefore, gender becomes something that we do rather than what we are. Consequently, people come to adopt multiple identities and roles as a result (Butler, 1988). Due to changing circumstances and context in which one might find oneself located, one may navigate between multiple roles or performances in 'doing' gender (Butler, 2004) however, that is never a fixed or once off thing.



Society also becomes influential as communities share values and attitudes in a culture bound by similar teachings about prescribed roles and behaviour. Society therefore plays a great deal in moulding an individual through shared practices. Men are taught to be men, and women are taught how to behave as women. What is deemed appropriate is never evaluated on a basis of fairness but serves those with power who are usually white males. Deutsch argues that " gender differences arise from the different resources to which men and women have access to, or the different social locations they occupy, it is through these structural conditions that gender difference and inequality is produced" (Deutsch, 2007: 8).

Feminist constructionist studies have shown that the word "Man" and masculinity have always been linked to subjects believed to command authority and exude power and respect. Men are seen to possess a "natural" superiority, supremacy and normative status. To this day, the word, "man" still carries tremendous power, and often designates

human beings, whereas the identity “woman” is associated with inferiority, lack, emotionalism and incompleteness. According to De Beauvoir, “Man thinks of his body as a direct and normal connection to the world which he believes, he apprehends objectively, whereas he regards the body of the woman as a hindrance, a prison, weighed down by everything peculiar to it” (2004:3).

De Beauvoir (2009) argues that throughout history women have always been subordinated to men, and that “man” has always represented rationality, normalcy, authority and the human norm. De Beauvoir’s constructionist insights are important for this study as they lay the foundations of understandings of gender ideologies and cultures that are still very relevant in contemporary society. De Beauvoir’s analysis starts at the microscopic levels of understanding gender in the formation of identities, and extends to the familial and macro society/institutional levels as layers that are critical contributors to the normalizing of gendered hierarchies. De Beauvoir, similarly to Butler (2004) makes reference to the body as a performativity object, where “masculinities” and femininities” are created through socially prescribed behaviour which come to be seen as “natural”. De Beauvoir therefore describes key features of gendered binaries, features to which I return to in this study.

The distinction between men’s and women’s roles in relation to work is one important aspect of this gender binary. Following De Beauvoir, feminist constructionists have shown that socialization, institutions and ideology have continued to disparage women and women’s worlds. These are often associated with domesticity, reproduction and nurturing. In contrast, prescribed masculinity is linked to action in the public domain, innovation, and, as this study will show, the rational world of scientific endeavour.



Lorber (1994) demonstrates how binaries linked to men and women's bodies are constructed and reconstructed in order to uphold the gender order. She argues that, in order for the gender social order to be operable, there needs to be consistency in the production and maintenance of differential gender statuses. Lorber argues that, the very purpose of "gender as a modern social institution is to construct women as a group to be subordinates of men" (1994; 282). Human beings then come to organise their lives within these unequal binary systems that serve as institutional classifications of what responsibilities and expectations are relevant to a girl/woman and boy/man.

## **Gender as an Ideology**

Understanding gender ideology is connected to understanding how gender is socially defined and reproduced. As several feminists have shown, (De Beauvoir, 2009; Butler, 2004; Lorber, 1994) gender hierarchies are not only important in distinguishing between groups on the basis of their biology. Gender hierarchies also shape gendered institutions, beliefs and knowledges. The well-known social constructionist, Judith Lorber, therefore shows the various ways in which gender manifests itself in ways that are perpetuated through gendered constructionism.

Lorber, having made observations of the pervasive nature of gender, argues that "gender construction starts with the assignment of a sex category on the basis of what the genitalia will look like at birth. The babies are then dressed or adorned in a way that that displays the category because parents don't want to be constantly asked whether their baby is a boy or girl" (Lorber, 1994:227). One's sex category then becomes their gender

status and is formalized with name giving, dress codes or colours among other social markers and gender constructs which explicitly, and implicitly through codes and symbols define the norms and expectations.

Lorber (1994) poses a similar argument to that of De Beauvoir (2009) by stating that one is not born a woman, but rather becomes a woman, that their 'becoming' is far from being a matter of personal choice. According to Butler (2004), gender then becomes a mechanism by which notions of masculinity and femininity are naturalized through performance. The body in this context becomes the medium in "an active process of embodying certain cultural patterns and historical possibilities, where the body through constituted meanings and similarities that it begins to engage in these performative acts where the body acts within theoretical contexts" (Butler, 1988:521).

Theorists such as (Lorber, 1994; De Beauvoir, 2009; Butler, 2004) allude to how one is conditioned to act out or perform, and frame oneself as either male or female. Feminist constructionists have therefore explained how important the workings of ideology are to the functioning of the gendered and binary system as both systems reproduce a certain culture "through the cultivation of bodies into discrete "sexes" with "natural" appearances and "natural " heterosexual dispositions (Butler, 1988:524).

In developing this view of the role of ideology, Ortner (1974) argues that the devaluation of women has over time created a 'natural' hierarchy of how things should be. The universal devaluation principle argues that it has been and still is in fact, biology that dictates that women are by nature non-thinkers and reproducers, thus making men the natural dominant sex. Ortner, further unpacks this and captures it neatly in this

statement, “not that biological facts are irrelevant, or that men and women are not different, but that these facts and differences only take on significance of superior/inferior within the framework of culturally defined value systems.” (1974: 71). These beliefs about gender are often attributed to physical and biological difference in very forceful ways. Thus, the role of ideology needs to be interrogated as ideologies play a very strong role in mystifying certain practices, certain knowledges and institutions that seem very authoritative and superior.

### **Demystifying “objectivity” at the SAAO and the field of astrophysics**

In developing my investigation of the ideological and structural foundations of the SAAO, it is necessary to consider its strategic importance and the forms of support that it has gathered. Established in 1820, SAAO is part of the National Research Foundation <sup>1</sup>(NRF). The SAAO is situated in the suburb of Observatory in Cape Town, Western Cape, South Africa. The SAAO is the national engine of astronomy in South Africa and the centre of its rapidly growing influence within Africa and globally. The SAAO remains the largest scientific and astronomy hub in the Western Cape with the University of Cape Town, and University of the Western Cape sharing in it and making up two-thirds of the astronomers at SAAO (Whitelock, 2008). The huge and lucrative investments in science, especially astrophysics, are a result of its perceived role in driving broader development processes in South Africa. It is however crucial to question whether these scientific development

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<sup>1</sup>The National Research Foundation, under the auspices of the Department of Science and Technology, a government funded entity responsible for science and technology is responsible for ensuring development of this field and to bringing sustainable economic growth aimed at improving citizens' quality of life. Thus a huge pool of funding is injected into SAAO and invested across all government funded science and technology institutions for purposes of carrying out research, train scientists, push for publications and so forth ([www.gov.za/about-sa/science-technology](http://www.gov.za/about-sa/science-technology)).

initiatives do anything to promote the democratization of our institutions and other science departments or if they are complicit with reinforcing traditional forms of power and exclusion.

Bharuth-Ram, (2009) under the mandate of the National Research Foundation commissioned an investigation into the decadal strategy for Human Capacity Development in Astronomy and Astrophysics in South Africa. The aim of the investigation was to look for viable strategies to better enhance the field of astronomy at national facilities together with astronomy programs in South African Universities. The concept document notes critical issues that need to be addressed in order to establish a viable South African astronomy research and technology community, with particular attention being paid to the expansion and participation of female South Africans.



Prioritization was given to the need to accelerate transformation and diversity in the workplace and to increase human resources. The need to find new students in the field and retain postgraduate students up to and beyond the Ph.D. level was also emphasized, alongside increasing research supervisory capacity at universities and the representation of Black South Africans in astronomy/astrophysics. The importance of outreach work and the need to strengthen and improve on existing outreach programs was also identified.

The process followed involved document reviews and numerous consultations with different stakeholders in order to shed some light on the state of astronomy in South Africa and on the development of skilled human resources in Astronomy. The current

status of the project remains elusive noting problems that were encountered at the initial stages of the project which resulted in programmes being scheduled for over 24 months. Therefore my knowledge on whether the endeavors to seek sustainable and transformative development plans within astronomy that would enhance programs and the potential for higher institutions of learning and academics in South Africa remains limited at this point. What is important for my research purposes is whether actual developments at a specific site substantively reflect any of the projected goals for “transforming” South African astronomy.

SAAO’s website prides itself on being instrumental in the establishment of collaborative post-graduate trainings at African universities in conjunction with the National Astrophysics and Space Science Programme (NASSP) whose objectives are aimed at producing highly qualified African scientists. However, this study will examine some of the disparities that exist between men and women and deep inequalities around class, gender and race that exist at the SAAO.

According to Vaughn, “science is knowledge based on truth, which appears as fact obtained by systematic study and precise observation, and that to be scientific is to be unsentimental, straight thinking, correct, rational, rigorous, and exact” (Vaughn, 2007: 1). Vaughn’s claims here allude to the way in which the natural sciences perpetuate an aura of their distinctive objectivity by claiming to be unemotional, rational and factual. As a student who has long had an interest in the social sciences and humanities, I have been isolated from these assumptions about knowledge, and often find them almost naïve in their claims to neutrality. At the same time, I have been struck by how deeply entrenched

the assumption of objectivity is in certain natural science domains, and how significant it is to subject them to feminist and constructionist analysis.

My interest in the claims to neutrality made by astrophysics alongside evidence of culturally constructed relations, knowledge and practices were prompted by a field trip to the SAAO in 2014, when, as a student of gender and feminism, I visited the Observatory to explore different kinds of knowledge-making from a feminist perspective. I observed that many highly qualified scientists and astrophysicists were ill-equipped to respond to my enquiries around the politics of knowledge. These questions included whose knowledge becomes authoritative in astrophysics and under what conditions, what are the relations between the values and cultural backgrounds of scientists and the work they do, and how are gendered, racial and class dynamics embedded in SAAO staffing and staff roles.



The scientific research enterprise presents knowledge production as authentic and reliable through extensive and rigorous positivist methods. The positivist view of science is a methodological philosophy that is used in the natural/pure sciences whose explanations and theories are based on an observable reality and observational terms. This form of positivist thinking or approach to science is tied to “empirically based, rational and objective enterprise, the purpose of which is to provide us with true explanatory and predictive knowledge of nature” (Keat & Urry, 2011:3).

According to Vaughn (2007) one example of the way in which science has been used to justify gendered politics is in certain biologically determinist work on male and female bodies. In some of the experimental studies undertaken the scientific evidence collated

showed that the male reproductive system was appraised as superior and fully formed human being, while that of a woman was reduced to abnormality. Women were seen to be inherently abnormal or inferior through being defined as those whose bodies were purely for procreation.

Hubbard's (1996) work makes reference regarding similar misconceptions, and in his critique of the early foundations of such prejudiced thinking, he focuses on the Darwinian theory of evolution as starting point for contesting the sexist and prejudicial traditional scientific models contending that women were intellectually inferior than men. Hubbard's concerning focus was around the ways in which the social and biological sciences in particular constructed sex and gender. Hubbard further argued that there are often many overlapping and blurred factors between the sex and gender binary and this also needed careful analysis in ways to counter the legitimacy of other explanations focusing on nature and biology.

Through the examination of sexist and often contradictory scientific investigations and findings, Vaughn (2007) argues against the predominantly sexist and putatively impartial nature of the scientific enterprise and posits that the biases of science are deeply embedded in patriarchal social structures. Vaughn refutes all claims to the objectivity of science, and claims that it is as "flawed" as other non-scientific forms of knowledge. It can never lay claims to objectivity, knowledge and 'truth' when it is tainted with sexism that is perpetuated by an inherently sexist scientific process. Vaughn further states that "women must be encouraged to pursue careers in science, must be given rightful credit for their work, and should be taken seriously when they criticize their colleagues and that discriminative hiring and promotional practices must be eliminated" (Vaughn, 2007:14).

Vaughn's critique of the sexism of science is not a recent perspective but one that has been brought to the fore by several feminist critiques of science. For example, Klein's paper (1993) also speaks of how this space inhibits women from entering it, how it favours the male stance, questions the notion of objectivity and, lastly, argues that the long-standing "respect for the scientific method is simply an outcome of our traditional (sexist, hence male-biased)" (Klein, 1993:57). In the same way that Vaughn labels the sciences as flawed, Klein (1993) labels the scientific enterprise as infected and in need of a cleansing that will remedy its sexist practices.

As this study will show, the deconstruction of gendered higher educational institution offers a useful model for critically analyzing the SAAO as a particular site of research and knowledge production. I draw on the leads offered by this work especially in critically considering institutional cultures.

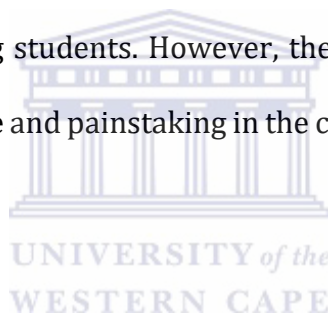
The exploration of the academy revealed an array of issues that affect women, and the institution as not just gendered, but one that has its own intellectual culture. Exclusions and marginalization of Black women in particular were also uncovered alongside biases in attitudes and perceptions pertaining to matters that seek to challenge gender inequality and exclusivity in this area.

The National Education Policy Investigation report showed that only 12% of academic staff was black, with majority of teaching staff being white, male and Afrikaners. Therefore the kind of knowledge that was disseminated was 'white male knowledge' on the grounds that it " reflects the cultural heritage of white males from the language of



instruction to the content of curricula, from the criteria for good and bad teaching to what ultimately counts as knowledge-all these have been defined very powerfully by 'universal' academia" (NEPI, 1992:6) .

Though the (1992) report may relatively seem outdated, it has been specifically cited in this study for its consistency and relevance to existing challenges that continue to plague national higher education institutions, with the SAAO befitting this context as a scientific, White, male-dominated educational institute. The suggestions and calls that were tabled which included a decolonized, de-racialized and inclusive education system are the very calls that are being demanded from the post-apartheid and democratic South African Higher Education by protesting students. However, the demands for transformation in higher education remain elusive and painstaking in the current education and knowledge model.



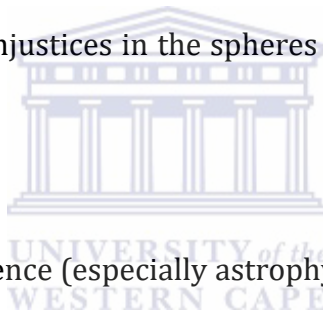
Many feminist students and scholars have undertaken analysis of the gendered institutional cultures of, for example, the political sphere and educational institutions (Barnes, 2007; Gaidzanwa, 2007; Goetz, 2002). Both studies by Barnes and Gaidzanwa (2007) focus on how educational institutions discriminate against women and perpetuate masculine values and patriarchal ideologies. Gaidzanwa's study is aimed at exploring the concept and meaning of alienation in academia. The overall findings of this study were that, academic institutions are an alienating environment for many girls and young women. Alienation here is described as a feeling of distress and isolation due to a loss of power, a sense of devalued purpose and meaning of one's work when there are deep divides between oneself and those in power in the hierarchy chain

Barnes (2007) looks at the binarism of the mind and body, and concentrates on ways in which women continue to be linked to “the body”, while men and masculinity are valued for the minds (and are therefore seen as rightfully “belonging” in the field of education). She also shows that teaching and research should never be seen as something static or gender neutral as most dominant positions of power are taken up by men and that the institutional life itself is full of competing interests and power imbalances in a highly testosterone ruled environment that thrives on female mockery, belittling and marginalization’s of women. She shows that, university institutions uphold these masculinist practices that work for male academics, as very little attention is paid to transformative projects which might actually denounces masculinist practices and remove discriminatory practices that seek to exclude female intellectualism.

Some of the findings into the work on political cultures are similar to those associated with work on higher education (HE). Like the domain of HE, the world of politics has historically been defined as a masculine, and its patriarchal ethos persists even in the context of certain countries’ legislative and policy efforts to address gender discrimination. In *“No Shortcuts to Power”* (Goetz, 2002) examines the position of women within gendered institutional cultures in Ugandan politics and policy-making and the constraints they have to deal with. In this particular study, the authors’ main findings about the masculine world in post-independence Ugandan era were that; party institutionalization served as a determining factor for women’s assimilation and their prospects in the design of political institutions. Women’s powers in terms of influencing strategies, advancing gender equity agendas, policy and representative politics are framed by one feature of the institutional framework which is the suppression of minority groups through policies that rule out pluralism, by inhibiting and silencing

female voices that seek to advance legislative dialogue which seeks to transgress by challenging male superiority rights within gender relations.

Goetz (2002) and other feminist researchers (Batliwala, 1996; Mgcotyelwa, 2012) argue that, in many traditionally patriarchal domains, women are strategically incorporated to address the need for governmental or other official demands for “equality”, yet lack substantive power. Equally importantly, feminist research on educational and political institutional cultures shows that women are under pressure to conform to standards, behaviour and working patterns that suit men, and that values, behaviour and roles that are traditionally associated with femininity are disparaged or marginalized. As this study will show, these patterns and injustices in the spheres of HE and politics are especially pronounced in my case study.



Interestingly, the domain of science (especially astrophysics) seems to neglect even the token or formal processes of transformation that are often in place in the HE and political sectors. It is as though the insights and politics of gender and critical race analysis were appropriate only to certain sectors, but that this discipline should remain untouched by the awareness and consciousness of power in the broader society. Thus, disciplines in the natural sciences reflect pronounced assumptions about certain groups’ authority as knowers. Moreover, western ideologies are always at the top of the hierarchy in establishing superior knowledge and determining standards of objectivity. The documentary titled (*Cosmic Africa, 2003*), speaks to this problematic phenomenon and shows how Africans have always been astronomers; however, their ways of knowing and being inventors are negated by western-centric ideas about astrophysics which have sidelined their early significant contributions. The film explicitly shows how science is

linked to Western modernity, and how thinkers and scientists located in nonwestern knowledge-making systems are simply excluded from the domain of astrophysics.

Bringing the tools of the social sciences and humanities to bear on the growing field of astrophysics in this country is precisely what is needed to bring immediate attention to the shortcomings of this field. As a gender studies student with a deep interest in how diverse knowledge systems and research sites embed certain values, I remain determined to explore an area that many consider to be “off-bounds” to feminist analysis.

Writing recently, several feminists writers from the US, Patricia Hill Collins (2000) and Africa (Diaw, 2007; Mbongo-Endeley & Ngaling, 2007; Vokwana, 2005) have argued that women’s marginalized positions have allowed them to develop inventive and vibrant intellectual traditions. Rather than these being non-existent, they are dominated by the dominance of masculinity authoritative knowledge that claims to speak in the name of human experience. My aim in this study is to draw on this body of work that focuses on sites and fields where feminist, especially black feminist analysis, is considered alien or irrelevant, or remains totally unknown.

## **Theoretical and Conceptual Framework**

As indicated in my opening discussion, the theory that grounds this research is guided by a feminist construction lens with its primary objective set on uncovering issues of power, dominance, and gender related issues or complexities. The feminist constructionist Lorber explains how gender is not only embedded in gendered bodies but can be embodied in other ways “gender as a social institution, gender is a process of creating

distinguishable social statuses for the assignment of rights and responsibilities” (Lorber, 1994:6). Due to the fluid nature of gender formations which are bound to change and evolve in different ways given the daily interactions we immerse ourselves in with different people from different parts of the world, and at work, there definitely should be a flexibility that would too, allow for institutional change.

It is the latter complexities that informed my methodological approach in this study, and the methods selected for this particular investigation as the examination of an institutional culture would need more time and access to the institutional site. My access to the site of inquiry was negotiated for by my secondary supervisor through her affiliation and status as an astrophysicist and Professor. The methodological framework and process, will be discussed in more detail in Chapter 3.

By drawing on conceptual and theoretical tools from social constructionism, feminist theorizing and hermeneutics, this study is concerned with the different levels of gendering which ultimately reproduce long-established inequalities in scientific institutional culture. Among many others, (Mbilinyi, 1992:35; Bakare-Yusuf, 2003; Davis, 2006) unpacks notions of social constructs around gender and some of the commonly used social science terms. Gender analysis according to Mbilinyi (1992) is concerned with examining the multifaceted layers of social relations and some of the commonly used socially and collectively, and the complex interconnections among gender, imperialism, class, race-ethnic relations” and also to challenge other dichotomies that are constructed within dominant discourses that tend to be supremacist in nature and have a pro-male agenda. By drawing on Mbilinyi explanation of gender analysis, this study offers insights into the different positions that women occupy.

My study also draws on feminist philosophy and epistemology of science, since I am interested in exploring the ways in which subject-positioning inevitably influences the knowledge that is produced, the ways in which this knowledge is produced and taught, and the contexts and forms through which it is celebrated and confirmed. In focusing on feminist attention to science, I will draw on feminist philosophers of science from various contexts. These have all focused on the overt and indirect ways in which science has been masculinized by marginalizing women's participation and by entrenching values and norms that reproduce patriarchy.

Sandra Harding has studied and problematized the dogmatic views of science and her feminist science critique framework will be a major guide in this study. Harding's feminist critiques are concerned with exposing biases that are a result of sexist, androcentric and hegemonic biases in scientific discourse and what is considered significant in knowledge production.

The overall aim for feminist scholars and feminist philosophers of science who are interested in advancing knowledge is not merely to expose the androcentric biases that exist as false, but to further develop alternatives that do not repeat such biases. These alternatives are seen to revolve around valuing marginalized groups standpoint knowledges, where these have been defined as liberatory methodologies that would be non-hierarchical in nature and would take into consideration situated knowledge, subjugated knowledge and partial perspective (Collins, 2000). The envisaged outcomes of accounting for different standpoints would then unmute the silenced voices of the vulnerable minorities that have been oppressed and whose voices have been absent.

The scope of my study prevents me from developing a detailed exploration of how standpoint knowledges can function toward the production of alternative scientific knowledges. However, I am constantly alert to the standpoint of my participants in thinking through the problems with authoritative knowledge production, including my own as a researcher. My participants' standpoint knowledge will therefore allow me to recognize and understand how particular marginalized experiences and locations lead individuals to pursue certain work strategies and goals.

Haraway defines objectivity in feminism as 'situated knowledge'. Situated Knowledges are what "offer more adequate, richer, better account of a world, in order to live in it well and in critical, reflexive relation to our own as well as other's practices of domination and the unequal parts of privilege and oppression that make up all positions" (Haraway, 1988:579). Haraway argues that, through accounting for subjugated knowledges, we can begin to learn from others. Through learning from other's perspectives, and understanding how this process and systems work to reinforce one another, then only then can we make claims of embodying feminist objectivity.

Apart from drawing on theoretical insights of feminist philosophy of science scholars, I shall also engage with work on discourse developed by Michel Foucault. As both feminist and non-feminist scholars have explained, discourses are always deeply embedded in power relations (Foucault, 1972;1982; Lewis, 2012). According to Keller and Kirkup, "Truth is not a collection of insights or information floating about, parts of which are sooner or later revealed or discovered, nor does it lie deep within us waiting to be freed.

Truth is produced through discourse and its production is involved with relations of power” (Keller & Kirkup,1992:6).

Michel Foucault (1982) further goes on to theorise power slightly differently, paying attention to “subjugated knowledges”. Similarly to Donna Haraway’s (1988) theorizing on subjugated knowledges, Foucault here is primarily concerned with political inequities within the process of knowledge production, and the overall control of those who exercise the power in a given historical and social context and consequently dominate in the production of truth claims.

For many social science and feminist researchers, the counter-to the claims of objectivity in much scientific discourse is that total objectivity does not exist, and that there is no such thing as a ‘truth that is just waiting out there to be uncovered’. Hermeneutical sciences posit that it is totally impossible to conduct research with detachment from your subjects, and what constitutes research is a relationship between the researcher and researched who equally work together in building a descriptive, exploratory knowledge based research (Biber & Leavy, 2006).

A hermeneutic alternative is a form of qualitative research commonly used among social science studies commonly understood as a science of interpretation, or making sense of the world. Thus, production of knowledge is dependent on what is already available out there, and all available knowledge is bound to lead to multiple paths instead of a single lens of western-centric and mainstream knowledge (Biber & Leavy, 2006). This links up with what Mohanty speaks to when challenging the hegemony of western scholarship. She argues that feminist scholars need to start dismantling and deconstructing western



ideologies and teachings and instead, work towards building and constructing what we can identify with in terms of our specific gendered locations in colonial or neo-colonial worlds (Mohanty, 1991).

## **Outline of Study Structure**

The first chapter is an introduction to feminist analysis, gender and science, with chapter two proceeding to frame this study by surveying research on women in science, gendered dynamics, institutional cultures in educational contexts, and power. The section guides the arguments raised and also serves as a foundation for the analysis phase of the thesis.

Chapter Three describes and rationalizes the research design and methodology. Focusing on how and why certain mixed methods are chosen, the chapter focuses on the extent to which theoretical awareness of the research problem needs to guide the choice of certain methods.

In chapter four, the research findings derived from discourse analysis of the space (observations) and interviews conducted are analyzed and discussed. Several themes emerge from the data gathered and are analyzed through thematic analysis. This chapter provides an in-depth analysis and discusses major themes that emerged in the data and also serve as a continuation of chapter three.

Chapter Five is a continuation of the discussions raised in chapter four but proceeds to elaborate on the institutional culture and symbolic meanings that entrench the authority of the SAAO. I conclude the study by considering recommendations and limitations in chapter 6.

## CHAPTER TWO

### LITERATURE REVIEW: Research Trends in Exploring Gender and Science

While the previous chapter has explained my theoretical approach, this chapter seeks to map out the range of literature to which I turn in analyzing my case study. As stressed previously, much South African (and African) work has been produced on the gendered institutional cultures of Higher Education environments. Although this work is valuable, I focus also on the relatively large body of US-based work that has focused directly on gender and science. The categories below summarize the core insights and analysis on which my own study draws.



#### **Erasure of Women's Bodies and Knowledge in Astrophysics**

Discriminatory practices and structural impediments are an obvious result of why women are still not advancing as significantly as their male counterparts in the field. Thus, more still needs to be done in order to allow for women to excel within the science, technology, engineering and mathematics (STEM) professions. The STEM field represents the four subjects which are highly driven by scientific methods, a field where that is overly represented by men, whilst women are still underrepresented despite their efforts to gain prominence and due recognition in this field. Griffith (2010) refers to this challenge as a leaky-pipeline for the STEM discipline as women and minority groups permeate the field and yet still remain at the margins. The unfavourable conditions within this field are likely to force women out again or have them drop or not continue to postgrad level with a STEM major.

One of the insights raised in feminist work on science in the global north concerns the erasure of women as knowers within the masculine domain of science. As a response to some of the frustrations faced by women in this field throughout the years, there seems to be a deeper emerging voice - particularly from the women within science - for feminism to be integrated and utilized as a tool within this field. My review of valuable literature therefore tracks the range of feminist and gender-sensitive resources that have drawn on feminist and constructionist insights. In view of the relative paucity of South African work, my study engages considerably with global literature in the field.

One important strand in this literature focuses on critiques of the neglected insights of women who have made significant contributions to the history of astronomy. A Presidential address given by Jocelyn Bell Burnell, a prominent Northern Irish astrophysicist clearly described the prominence of women in astrophysics, as well as the ways in which their innovative work was ignored. In her 2004 presidential address titled *"A celebration of women in astronomy"* she gives insight into how even these women that are distinguished figures in this field have experienced painful challenges of being part of an institutional culture that privileged male bodies and actively discriminated against women in this field (Burnell, 2004).

The history that looks into the lives of women in STEM highlights the huge obstacles that patriarchy has presented for women, with this resulting in them having little to no educational opportunities in their favour. Some of the struggles that women faced are well-captured by Schiebinger, "women have never fared well in official institutions of science-past or present. Until the twentieth century, all but a few privileged women were officially barred from universities and scientific academies" (Schiebinger, 1987:135).

Schiebinger offers an insightful historical background of women in science whose names, histories and contributions have all been conveniently erased and neglected by what she calls 'male stream' (mainstream) science. It is against this background of erasure that Schiebinger researches the history of women and some of their most prominent contributions and further seeks "to unveil distortions in the very norms and methods of science that have resulted from the historic absence of women from any significant role" (Schiebinger, 1987: 307).

This is connected to a 2010 research report compiled on why there are few women in science in the US by Caroline Hill (2010). Insights are indicative of environmental as well as social barriers that still prevent women from advancing in this field. Some of these challenges are attributed to stereotypical gender biases connected to the uninviting climate of the STEM field. According to (Hill, 2010; Griffith, 2010), the STEM spaces, more often than not, hold women back in terms of progress due to its sexist and discriminatory nature.

In a global survey examining women in science in Canada titled "*Is There a Land of Equality for Physicists*", the survey quantitatively displays inequities and equalities that women face, a stark everyday reminder and reality for them as women that are in this field. The survey critically examines things such as access to resources amongst men and women in various countries, and raises patterns that are relevant to a science institution like the SAAO. The survey's attention to issues such as funding opportunities, acknowledgement of research work, access to laboratory spaces, and access to presentation forums for one's work are, as I will show, highly relevant to my case study.

Throughout the analysis, the findings reported that women always face prospects of slow progress or lack of advancement in their careers as lack of resources and equal opportunities for men and women working in scientific spaces can have devastating and everlasting effects on the disadvantaged group (Ivie & White, 2015). A resource guide which also documents the history of women in astronomy, titled *Unheard Voices: Women in Astronomy* (Hammel, 2014) not only deals with the invisibility of women, but also makes visible the neglected ways in which astronomy is practiced in various cultures and forms beyond the conventional Western-centric understanding of astronomy.

This acknowledgement of the multiplicities of astronomical and scientific knowledge not only offers a range of some of some of the names of somewhat 'forgotten' women in science. It also examines a variety of transnational works done under the rubric of astronomy of different cultures (Fraknoi, 2014). Again, this is a perspective that is connected to a feminist agenda which calls for multiplicity and openness in this field. As chapters four and five will demonstrate, women within the field often demonstrate the perspective and subject-positioning that could allow them to make important intellectual contributions and thereby open up the field.

It is important to note that, despite the ongoing marginalization of women and the persistence of patriarchal cultures, the numbers of women entering the world of science has been growing. South Africa has witnessed a steady increase in the number of women who enter the field of science, and the quantitative growth often seems very encouraging. Many responses to this growth take the form of celebrating women's achievements and targeting women for special funding. As I will show, however, the numerical inclusion of women is not a definitive indication of meaningful transformation. As feminist analyses

of Higher Education has also shown, the mere increase in the numbers of women in Higher Education is not an automatic indication of gender transformation.

However, it is crucial to reflect on the celebration of the numbers of women in South African reports that include media coverage. This attention to “Women in Science” might often seem feminist, although it lacks the critical understanding of gender barriers and power reflected in politically and theoretically informed feminist approaches. For example, a *Mail & Guardian* (2014) special issue reflected on the journey South Africa has embarked on since the year 1994 and reports on some of the strides it has made since the 20 years South Africa has celebrated as a democratic country. Of primary concern was the democratization of the field of science itself and the progress made on eliminating the apartheid legacy of poverty, unemployment, and inequality. Overall, the article reports a significant increase in the number of women’s participation in this field and continues to monitor the targets it has set on attracting women into the sciences by allocating vast amounts in funding reserved specially for women, and to bridge the equity gap in employment, research, and scholarship (<http://mg.co.za/article/2014-08-18-20>). Such evidence of progress is important. However, my analysis will indicate that overhasty conclusions about successful changes can prevent us from understanding deeply embedded and ongoing problems.

In South Africa, women’s achievements in science have also been celebrated in public events and awards. The year 2016 saw an increase in the number of women that received the (WISA) Women in Science Awards (Mail & Guardian, 2016). The WISA annual ceremony also serves as a celebratory marker of the achievements obtained by those women in the science and technology field. Some of the awards that were scooped up by

women were; young emerging scientist award, distinguished women researcher award etc. The purpose of these awards is to allow women to take an interest, and flourish within the science community. The Minister of Science and Technology, Minister Naledi Pandor strongly emphasized the importance of gender equality in the field of science and how its achievement, or its balance thereof would assist women to feel respected, safe and as equal to their male counterparts (<http://.gov.za/speeches/2016-women-in-science-awards>). The African Union (AU) also pledged equal support and commitment by signing a resolution committing itself to advancing women and girls in the field of science, technology and innovation and further committed to addressing gender disparities.

Though there are some strides made by the South African government under the science and technology banner, the number of women compared to males in this field remains relatively low. Noting all efforts made by government and strategies put in place to boost the enrolment of women in this field, women still remain at the bottom of the hierarchy in terms of numbers of women.

Evidence of this is provided with certain studies that take into account both quantitative and qualitative changes. A global study conducted by Women in Global Science and Technology (Wisat) together with the organization for Women in Science for the Developing World consisting of Brazil, South Africa, India, Korea, Indonesia, European Union and the United States showed that, though a significant number of women were recently being presented with 'golden' opportunities, their overall participation in the science, technology, engineering and mathematics remained low.

The results from South Africa also demonstrated that women remained under-represented in certain areas of this field such as leadership, management, and executive positions. The research also exposed the gendered and exploitative nature of this field with its discriminatory belief that greater access for women, would mean a decline in standards. Additionally, the data exposed a positive connection between the parity of women and several other empowerment factors in areas such as the labour force, government and policy and the issue of access to financial, economic and technological resources (WISAT, 2012).

Studies dealing with girls and women's exclusion from science demonstrate biased socialization processes and the role they play in perpetuating difference and inequality. These processes under-prepare women for this field. The socialization of an individual works as a critical determining factor of one's professional choice as it has the ability to make both men and women believe in societal notions that claim that women are more linked to emotion than reason and also tend to confine them to private spaces, and professions of care such as nursing, outreach and social work and not actual 'hard science' like astrophysics. In the bigger scheme of things, this socialization process fostered by school systems and institutional sites are what ultimately work to effectively exclude young girls and women in science, technology, engineering, and technology (STEM) fields.

The Department of Education (DoE) conducted a survey of grade 12 pupils that are in the science, mathematics and technology field and revealed a slight percentage increase in the number of girls within higher education. However, some of the key findings of the position of girls/women in the schooling system were recorded as follows; Poor quality



education opportunities place girl's educational prospects at jeopardy along with other socio-cultural challenges that also serve to diminish their development prospects. Cultural and social obligations shift the burden of household responsibilities disproportionately onto girls, and this often means that they will lose out more time away from their books and subsequently miss out on leadership opportunities at school whilst holding them back from advancing in this field, and these challenges would ultimately push them out of the scientific stream and are likely to be drop-outs or fall pregnant earlier than they would have expected.

Positive moves initiated by government are also reflected in the way the Department of Science and Technology continuously pledges its commitments to the developments of science students, scientists and researchers that are women. It seems all their efforts are yet to fully translate into tangible progressive results. There continues to be a growing formal and governmental concern and challenge as far as women in astronomy are concerned. There is also awareness of the unequal power they hold and roles they occupy in comparison to their male counterparts.

The South African government has since 1994, identified challenges that need to be overcome particularly within astronomy as a field with promised potential. This potential can only be achieved through a reformulation of new science policies as a way of preparing for new generation of scientists (Whitelock, 2007).

Yet it is noteworthy that, despite the transformative efforts made by government and certain oversight bodies, the SAAO rarely recognizes issues of justice, representivity and the status of women as core areas for transformation. I encountered this clearly when I

attended one of its lectures aimed at making the 'scientific' public and astronomy community aware of its engagement with national processes during its *"Implementation Plan for the National Strategy for Multiwavelength Astronomy"* Public Lecture at the SAAO Headquarters (Chetty, 2015).

The address was set in motion to bring together the Astronomy community in order for it to discuss broader issues to be prioritised at National level in order to advance the area. Though it touched on important issues, some of these were often too technical and did not really speak to finding resolve to some of the burning issues affecting women in the field or how to better their conditions of employment for women working either in the SAAO or in science and other NRF hubs. If there is anything that was not too technical or simplistic and pertaining to human capital, it was merely a vague bulleted mention of pragmatic programme domains. Generally, therefore, the NRF implementation plan is silent about the everyday burning realities that women face in the field.

To deal with some of the hostilities that cloud the field, women often find themselves confronted with the worst kind of treatment and in turn, they end up devising their own methods to cope in such environments. Holbrook (2012) conducted research in the United States in which she explored survival strategies to help African American Astrophysicists and Astronomers to persevere, thrive and obtain that Doctoral degree. Among the responses she explores is for women to remain oblivious to what is happening around them in avoiding a hostile environment. Generally, Holbrook shows the ability to disconnect or detach oneself at times, along with therapy and medication were some of the strategies with which women could arm themselves during the process of embarking on a PhD journey, or throughout their professional career in this field.

## Feminist Critiques of Science

Different feminist studies argue that prevailing information practices place women at a disadvantage by denying them epistemic power, and further slandering their feminist intellectual styles and methods of learning. Various critiques convey a common thread that is, science and scientific knowledge can never be neutral or purely objective as its basis rests on complex and unequal relations that are masculinist in nature and therefore in need of thorough examination. Such examination exposes that these fields represent westernized masculinities and male hegemonic culture (Schiebinger, 1987).

In focusing on gender and colonialism, Keller argues that “Particular emphasis in western science has placed on these functions of knowledge is twin to the objectivist ideal. Knowledge in general and scientific knowledge in particular, serves two gods: power and transcendence. It aspires alternately to mastery over and union with nature” (1982:598). Science embraces strong androcentric biases that privilege men and work against women, and critiques call for a de-gendered science that will take into account a number of issues, and be sensitive to them in ways that could in fact enrich scientific projects.

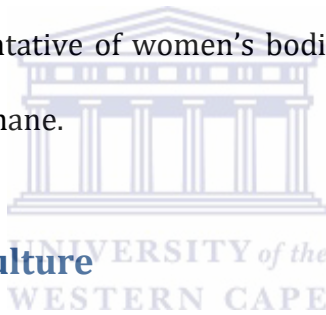
Harding (2002) argues that the science field is one that privileges itself as the authentic body of knowledge production and excludes certain important sites and sources of knowledge. Feminist studies or critiques of science therefore show that, claiming universality and objectivity of positivist scientific methods in relation to all other forms of knowledge production methods is completely flawed. This fails to locate and account for the knowledge and experiences of women as well as other subordinate groups.

Haraway (1988), draws largely on Harding in her critiques of science. However, her argument is premised on 'science's positivist ignorance which serves the interests of a single group, and that of white male scientists who dominate the field with their hierarchical and positivist orderings that only advance their own agendas, and that is the agenda of the white male in this field.' Haraway (1988) brings to the fore the important issue of subjugated knowledges.

Subjugated knowledge theories posit that, in order for knowledge to be objective, it must be recognized that knowledge in the world is partially collected from the varying vantage points of different people's locality. Her conclusion is that 'science' would benefit from understanding and taking into account how different knowledge systems can work together. Traditional scientific methods are premised on what (Haraway, 1988) refers to as 'positivist ignorance'. The positivist rationale is premised on the ideology of an existing, observable and measurable truth that has an ontological and epistemological stronghold.

Longino (1990) argues that the traditionally conventional methods of the sciences that claim for value-free and pure and objective power into scientific enquiry are simply outdated, and that scientific methods need to be premised on a methodology that can also account for social influences and cultural values if they are to be deemed powerful knowledge structures that will not be limited to the sciences when providing evidence, but rather have a guaranteed evidence reliability that can account for theories of any scope and depth. Therefore, a feminist science approach would analyse, deconstruct and address the dynamics of power and inequality within the science discipline which could further lead to a better science.

Smith (2005) offers a view that is similar to Haraway's. Smith argues that authority ought to be rooted in one's knowledge and according to their perspective and how they view the world, hence standpoint theory'. Standpoint Theory is premised on the notion that knowledge is not objective as it is subjective to a particular standpoint at a given time. As standpoints or point of views differ and can never be identical, so do standpoints. Thus, standpoints are fluid, and as constantly changing as they are in nature, so is the need to constantly configure, revisit and assess standpoints. In recognizing this, (Dugdale 1988; Keller 1983) argue for a critical feminist engagement, and similarly to Harding (2002), call for a science that would be 'women friendly'. This would mean a world without masculine symbolism, representative of women's bodies and knowledge and one that establishes a science that is humane.



### **Gendered Institutional Culture**

Vincent (2013) defines institutional culture as values, traditions and customs within an institutional space that we come to share in as individual members that make contact with one another. In these, each one becomes a part of the whole, and each person shares in other's lived experiences and interactions. These interactions shape our lives and inevitably has potential to affect each member of the group. All institutions are bound to have one form or another which sets in place a hierarchical structure that directs who does what, who has more power or influence over the others. Since these structures of hierarchy are covertly formed, they often go undetected thus, making it easy for these unequal power relations to be maintained and perpetuated over time.

Any institutional culture has a male and female dynamic and these vary vastly as men and women come together with their own socially and culturally constructed identities and ideological expectations. The diversity in cultures whether in terms of femininity or masculinity or class difference, according to Vincent (2013) is something that is rarely valued, meaning that some cultures come off as more dominant and homogenous than others, or highly privileged than others.

Vincent's observations are directly relevant to the SAAO. The norms that the SAAO embodies are not necessarily a true reflection of everybody's norms, but rather the norms of the dominant authoritative voice which ignores, erases or marginalizes those that are in less power or control to make their voices heard. These are the underprivileged, the subordinate, and often than not, the 'woman in a man's world'.

The persistence of this system is often guaranteed by how it is mystified and rationalized. Here, embedded ideological beliefs and symbolism often play a hegemonic role, in that dominant values come to be accepted as norms by subordinate groups. In *Gender, Symbolism, and Institutional Culture*, Gherardi looks at how gender relations are socially and discursively recreated, and how they may be investigated in unexpected ways. Gherardi (1995) convincingly writes about routes in which patriarchal learning is coded in regular practices. She shows that dichotomizing chains of command are extremely obstructive to the advancement of equitable feminist knowledges.

It is significant that the dichotomizing chains that Gherardi describes creates boundaries on the basis of gender as well as other identities. This is what Maldonado-Torres (2016) alludes to when he speaks about decolonizing and defying Eurocentric forms of

knowledge and all imperatives of whiteness, specifically, in scientific research entities and institutes of higher learning. Maldonado-Torres urges for a critical assessment of all institutions that are meant to serve society and the general public which still very much exude superiority and white privilege and instead calls for these to be dismantled in order to allow for a fair and unbiased view of power and knowledge. This is adequately captured in the argument he makes which calls for decolonization, and that decolonization would mean that whiteness must fall.

The complex ways in which institutions can covertly justify their authority are explored in a study by Diaw (2007) on institutional and intellectual cultures. One of her objectives is to find out how knowledge actually translates into power that actually can legitimize exclusions. Institutions of Higher Learning that are responsible for knowledge production have also become highly competitive for the different types of knowledges which are further weighed and ranked differently further contributing to fragmentations that make it impossible for the differently produced knowledges to communicate with each other.

'Power' is a central point that runs throughout this paper, as the notion of studying power dynamics is never clear-cut, but has many complexities. She therefore makes a similar point to Maldonado-Torres and concentrates on the links between monetary forms and resources and class, status, gender, race, and all other intersecting categories.

When institutions start privileging certain things over others, that immediately constitutes imbalance as hierarchies are formed and these hierarchies basically determine who is more powerful over which certain group or individuals. Again, with

selecting or favouring types of knowledges and ways of thinking, this again sets a disturbing tone which creates divisions and categories of the 'knowledgeable' 'powerful' and 'credible thinkers' over the 'mediocre knowers or knowledgeable' with those deemed most knowledgeable usually presiding over the top of the hierarchies. These categories that tend to dominate knowledge production are usually non- African White males.

These are usually the powers that reign over academic institutions, and scientific institutions like the SAAO who also determine what should count as knowledge, and what should be classified and maintained as mainstream knowledge, and what needs to be weeded out and does not belong.

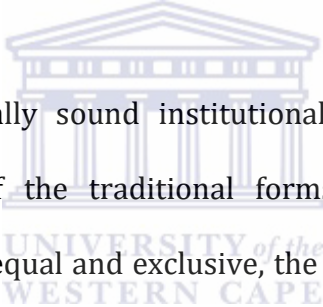
All institutions are arranged in ranks and hierarchies with each member occupying different positions in the hierarchy. This form of unequal distribution of social and class status also determines what resources are allocated to a person and in what quantity. The SAAO reflects the exclusions and biases that feminist studies have globally critiqued as being hierarchical masculine in its practices, where power and control over resources and knowledge production are monopolized by White masculinities.

In offering a solution to some of the ways in which the SAAO can eliminate some of its institutional biases and exclusionary practices, Fox (2001) conceptualizes the critical need of scientific research sites to be examined due to their hierarchical nature and self-privileging status of the sciences that create gendered relations in the workplace. Fox is particularly important in this context for the insights she offers on science, women and the academia, and further stresses the importance of paying attention to the organization of the workplace, how power is distributed, hierarchies are formed, its methods of



evaluation and the status of racially and ethnically different women as this study also makes similar attempts.

The insights that are presented in this section are useful in mapping transformative strategies that will enhance access and inclusivity in a publicly funded research institution like the SAAO. The conceptualization that has been mapped can be beneficial for the organization to better understand what informs gendered dynamics, how group and individual attitudes, values and beliefs converge to create a work culture that is determined by those in power whilst simultaneously rejecting the practices and principles of the minority groups that do not feel represented by the existing culture.



In creating fair and functionally sound institutional practices that would not be stereotypical or exemplary of the traditional forms of doing science that have conventionally been biased, unequal and exclusive, the SAAO would need to align itself with gender mainstreaming policies in order to combat what Shackleton (2007) writes about universities' gendered institutional cultures and the persistent gender inequities found in academia. Shackleton focuses on women in leadership positions in higher education in South Africa in an attempt to get deeper insights of how complex and multi-faceted gendered attitudes can contribute largely to the maintenance of an androcentric status in higher education and what he refers to as 'strongly male institutional culture of higher education'.

The findings of this study indicated that, women's invisibilities were a result of their conformity to be assimilated into an organizational culture, thereby suppressing a big part of who they are or ought to be. Shackleton concluded that universities tend to

dismiss gender as an organizational dynamic worthy to be looked into and that on its own perpetuates hegemony of a male norm. An analysis of how the SAAO may also be guilty of having perpetuated a male hegemonic culture through dismissals of gender specific agendas will be revealed in the analysis and discussion chapters to follow

## **South African Higher Education Institutions**

A discussion of research on higher education is necessary in that the Higher Education (HE) sector reflects many of the patterns at the SAAO as an institution of learning and research. Barnes argues that, "African universities should not be seen as static, gender neutral spaces to which women have been benignly and invisibly added" (Barnes, 2007:12). Barnes argues that these spaces and places are intricately marked with codes for man as thinker, man as aggressive debater, man as athlete etc. She insists that the addition of women to this men's club is thus not only a statistical but also an extremely meaningful social and symbolic exercise which is highly likely to prove to be conflictual in the long run.

As Barnes (2007) argues that gender in an institution of higher learning, teaching and research should never be seen as something static or gender neutral her discussion further interrogates ways into which universities can be inclusive in a manner that would meaningfully engage and accommodate even those considered to be on the margins of organizational and institutional acceptance. Barnes argues that constant reflexivity about the curriculum is also important in strategies that are aimed at transferring knowledge in the classroom for all needs of women and men coming from differing backgrounds and histories, and that this different histories should never be erased from its subjects but

rather presented and accounted for as a way of maintaining critical consciousness alive and to expand on existing knowledge paradigms.

For Institutions of Higher Education, teaching and learning can be very hostile spaces for women and other marginalized groups. Women tend to be overrepresented at administrative, clerical and assistant related levels whilst dramatically underrepresented at more senior levels and women of colour are usually the worse off when it comes to the allocation of teaching posts as this means that they are usually right at the bottom of academic teaching hierarchy where it has historically meant that lecturing opportunities were held back from non-white academics. Some of the most atrocious institutional inequalities have been documented on historically black and white institutions where hostilities often manifested themselves in political student protests at Historically Black Universities as a way of resisting white domination and racial segregation in institutions of learning.



Responding on some of the structural differences and inequities between HBI and HWI, Hames (2007) argues that it is imperative for one to have sound knowledge of intricacies and nuances in each South African academic environment, as each academic institution comes with its apartheid baggage and apartheid intersecting with issues of race, culture, language, and socioeconomic factors.

Hames (2007: 2-5) argues that policies within the higher education sector suggest that South African policy making appears to address the rights of groups previously marginalized on the basis of race, gender and sexual orientation. However, no one can really ascertain what the implicit implications are with regards to these policies and their

covert biases in higher education institutions. In endorsing this, Mama, (2007) calls for an activist scholarship which focuses on the development of a curriculum that is globally informed and locally grounded and that recognizes and includes the diverse struggles of women and other vulnerable and previously marginalized groups.

Lewis (2001) and Gqola (2002) comprehensively touch on the role of activism in scholarship by describing not only the importance of opening up the academic scholarship fraternity to being sensitive on issues of difference, but the overall prioritization of the connections between imperialism, gender and race as tools that have for a very long time sought to legitimize hierarchies that are based on the exclusion of women of colour in academia. Lewis and Gqola both offer deep insights that attempt to interrogate the existing patriarchal undertone that is rooted in academia by questioning western knowledge values that seek to ascend Western European thinking and knowledge production methods to the peaks of hierarchical levels which in turn undermine and demonise locally produced knowledge and minority voices. It is at this juncture that Lewis proposes that “we need to re-define what constitutes expert knowledge to always include feminist knowledge and approaches” (Lewis, 2001:2).

Lewis’s latest offering gives more specific insights into the role of universities in maintaining redundant teaching methods and monitoring bureaucracies set in place as surveillance on academics whilst the outdated teaching methods work to undermine the humanities approach whilst privileging the natural sciences and that we need to move away from methods of the past if we are to envision a postcolonial/modern day university where colonial manifestations cease to exist and allow for harmoniously, academically viable and progressive university environments (Lewis, 2015).

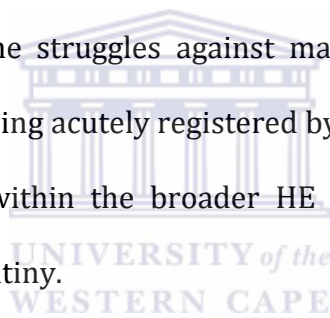
What makes the work and theorizing done by (Hames, 2007; Lewis, 2001;2015; Gqola, 2002; Mama, 2007; Vincent, 2013) particularly important for this thesis is not just their emphasis on the power of acknowledging difference and the diverse struggles of embodied, racialized bodies. They also pay detailed attention to the various post-apartheid and postcolonial relations, procedures and structures that perpetuate highly undemocratic power relations. In mapping out the body of intellectual work that presently confronts power in institutions of higher learning, it is also important to take into account current intellectual activism at South African universities.

The student movements of 2015-16 are calling for free quality education which was promised to them over 60 years ago. Many have shown that, there are more complex struggles that are being advanced by this movement with each institution driving its own agendas according to its hierarchy of needs. For example, the University of the Stellenbosch protesters prioritized the 'language' policy as a critical point that would emancipate the minority group which are mostly non-Afrikaans speakers. The University of Cape Town firstly expressed their feelings of frustrations through Cecil John Rhodes' Statue which they perceived as an outdated object of colonialism and apartheid. In contrast, the University of The Western Cape has been concerned with issues that seem to be a reality and part of a history associated with Black youth. Their struggle was for government and the university to do away with the re-payments of historic debt, free-decolonized education.

The intensity and explosiveness of the FMF protests at institutions of higher learning provide a number of insights into why deep changes are needed at many research and

education sites in South Africa. They also reveal the distinctiveness of changes at particular sites. Students at each university should not be treated as a homogenous group but rather as constitutive of a range of dynamics that cut across different pasts/histories, opportunities/prospects, upbringing, wealth and so forth.

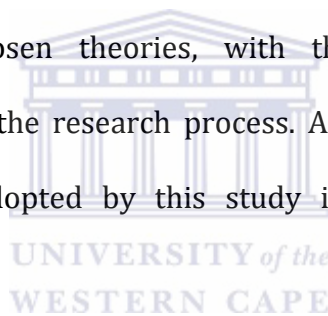
What might have sparked the protests and served as common denominator across the academic institutions in the country might have been Fees Must Fall. However, as the movements become increasingly volatile, complex and intense, it becomes clear that the issues of power based on class, race, colonialism and gender are far from abstractions in South Africa's institutions of higher learning and research. They are realities in post-apartheid South Africa, and the struggles against many entrenched hierarchies and alienating circumstances are being acutely registered by many young South Africans. As an especially privileged site within the broader HE landscape, the SAAO therefore demands investigation and scrutiny.



## CHAPTER THREE

### METHODOLOGICAL FRAMEWORK

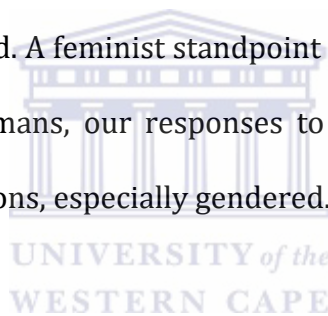
As a feminist researcher, one is consciously aware of hierarchies, power struggles, and gendered dynamics that perpetuate inequalities. As a result, one devises and draws on research strategies for identifying and analyzing underlying causes and oppressive notions that dominant societal ways of seeing and thinking often obscure. This study therefore seeks to use research methods that carefully explore and capture the attitudes, perceptions and experiences of women and gendered patterns at the SAAO. It has been said before (Gillen & Petersen, 2005) that, the type of method one selects is often informed by specifically chosen theories, with theory and methods mutually complementing each other in the research process. As discussed in this chapter, the methodological framework adopted by this study is in line with the theoretical approaches used.



Many studies of the institutional cultures and positions of women in science have been quantitative studies that have sought to investigate the positioning of women and minority groups within STEM fields. Though these studies have been useful in mapping the number of women in the science and technologically related areas, they do not offer many research strategies for understanding imbalances (Griffith, 2010; Hill, 2010; Ivie & White, 2015). Due to the numeric, technical, scientific and quantifiable modes of presenting or communicating study findings in the sciences, quantitative studies usually dominate in this area. Moreover, few of these quantitative studies have been undertaken by feminists outside the discipline. By using methods often associated only with the social

sciences and the humanities, this study tries to make an intervention into dominant the appraisals of women and gender in the world of South African astronomy.

There are multiple pathways one can take into knowledge and, the perspective one adopts, will offer varying insights and perspectives. (Burns & Walker, 2005) argue that a research study can only be called feminist if we are aware of the gender dynamics and all other power relations that come into play. She therefore draws attention to the way that certain kinds of research questions, conceptualization and analysis must inform analysis that squarely confronts gender. Feminist standpoint is therefore crucially linked to my use of methods aimed at understanding and foregrounding the voices of those that are usually silenced or marginalized. A feminist standpoint makes the claim that, though we may all face challenges as humans, our responses to challenges will be diverse and determined by our social locations, especially gendered.



Previous chapters have alluded to feminists who draw on 'feminist standpoint', with these including (Harding, 1986; Haraway, 1988; Smith, 2005). Central to their insight into constructed social meanings, the marginalization and stereotyping of women, gender ideology and patriarchal power relations are ways of exploring reality that allows them to expose what is usually silenced. Consequently, standpoint theory has been key in my methodological choice and in informing the qualitative methods that have been chosen for this study.

Apart from the importance of using qualitative study to understand the complexity of gender and power in science, the use of eclectic and flexible methods is also important. Among these methods, participant observation, which allows for a multi-layered



uncovering of space, its culture, artifacts, and social messages is of key significance. As a participant observer, I tried to immerse myself deeply in the social milieu of the observatory, by taking notes; recording voices, sounds, and images; and asking questions designed to uncover meanings behind behaviours.

Meaning is socially constructed, so is everything that informs what we know. Insight was shed through the use of feminist standpoint in searching for meaning in spoken words as well as in-between the silences and observable objects. The observations also exposed some of the more oblique and indirect forms of meaning which are usually undetectable as they are often hidden in symbolisms, architecture and design or in artwork.

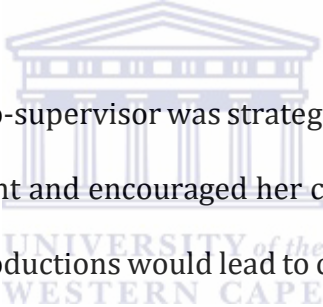
## **Data Collection Methods**



In seeking to understand the culture of my research site, I drew on aspects of feminist ethnographic research, which attaches paramount importance to observation over an extended period and focuses on women's experiences. Richelle Schrock (2013) defines feminist ethnography as a productive methodology that allows feminist researchers to produce knowledge in a specific context and placing women and their lives at the centre of the research. Schrock argues that this methodology further allows researcher to be cognizant of both benefits and detriments of productivity when exploring women's experiences of oppression, whilst simultaneously being aware of the agency they have. It is a research methodology that informs how the research process will unfold. As this methodology is usually selected for purposes of uncovering how gender operates within different contexts, cultures, subcultures and societies, it was useful in allowing me to

delve relationships, processes and ideologies that often lay beneath the surface of seemingly “ordinary” work experiences and environments at the SAAO.

Ideally, feminist ethnography should entail long periods of careful observation. Field-work ran throughout the full month of May, 2016. I tried to compensate for the relatively limited period available for on-site research by visiting the observatory regularly and spending full working days there, meaning I would arrive between the hours of nine to ten o'clock. I used the work-day nine to five framework to carry out my observations of different moments and spaces. I was able to forge intimate relationships with staff and spaces due to my co-supervisor's own access to the SAAO.



The research facilitated by my co-supervisor was strategic and beneficial in the sense that she introduced me as her student and encouraged her colleagues and other staff to take an interest in my work. The introductions would lead to contact details exchange and that is how I initially acquainted myself with the space and those that inhabit it. This strategic angle into getting me ‘in’ was also replicated during tea times when the employees at the SAAO were having tea together. The same method was again modelled at the University of the Western Cape's Physics Department where my co-supervisor is also a Professor.

My study made use of mixed data collection methods in order to collect a range of data to obtain as rich an analysis as possible. Mixed methods also allow for exploratory research, as they allow deeper understanding and interpretation of women's experiences of gendered dynamics from an institutional perspective. Data was extracted from interviews, and discourse analysis based on participant observations of objects, written and visual resources and physical spaces. The physical spaces I refer to are the actual

premises of work, and the social spaces that are provided for lunch, tea breaks, unwinding, as well as the sites close to the observatory where astronomers and sometimes other SAAO staff regularly visit to unwind. Using a multiplicity of methods allows for the researcher to approach the problem from different angles and therefore helps in giving more insight. What follows is a more detailed discussion of the methods associated with my methodological approach.

## Sampling

For the purposes of this research, heterogeneous sampling also known as maximum variation sampling (MVS) was selected. This is basically a purposive sampling method which deals with selecting subjects from a broader spectrum that is related to the topic both in relevance and depth (Oliver, 2006). Maximum variation sampling allows for the subject at hand to be scrutinized from all possible angles, and works excellently on a smaller sample as is the case with my four (4) interviewees.

After I had identified my participants with the assistance of my co-supervisor, I promised to get in touch with them via email when the time came for me to start fieldwork. It was when my actual fieldwork was scheduled to start that problems arose. Only 1 of the 3 participants that had initially promised to partake was still available. There are several possible reasons for this. One may be the importance of my coincidentally regular contact with her at the university and at the SAAO during academic functions. I also believe that certain staff developed a reluctance to be interviewed when they considered that my critical perspective might affect their male seniors' perceptions of their "loyalty". For some, the research might have been seen as a 'threat' to the culture of the SAAO. As conveyed in the analysis that follows, I believe that the institutional culture implicitly

places considerable pressure on employees to “toe the line” in ways that maintain, validate and perpetuate a hegemonic masculine culture as a way to gain acceptance in an overtly masculine culture (Plester, 2015).

Being perceived as a ‘whistle-blower’ carries negative assumptions and implies that one is violating a fraternity or code of fidelity which affirms loyalty obligations at all times (Grant, 2002). The perception that speaking about workplace injustices constitutes the breaking of a ‘confidentiality code’ is in fact part of the troubling ethos at institutions such as the SAAO. Subsequently, I wrote letters of requests, attaching the study’s information sheet, consent forms and my ethics clearance to prepare them for any ethical concerns they may have had and also as a way to show them that the investigation was fully in line with the requirements established by the University.

**My eventual sample therefore came to consist of the following:**

Participants	Age	Race	Institution	Marital Status	SAAO Affiliation
Participant 1	31	Black South African	UCT	Not Married	Post-Doctoral Fellow
Participant 2	35	Black South African	UWC	Not Married	Administrative
Participant 3	39	White South African	UWC	Not Married	Research Astronomer
Participant 4	51	African American	UWC	Married	Astrophysicist

The sample therefore consisted of four (4) women between the ages of 31-51 who are all working within astronomy in various institutions. All these women have some linkages to or have double status with their respective academic institutions and the SAAO. Only 1 of the 4 is married. All these women are at different levels in their jobs. Their jobs included positions as professor, researcher and administrator. Three of the four hold doctoral degrees (PhD) and all four of these women are connected to the SAAO and most are required to spend at least one day a week depending on the nature of their affiliation there as illustrated on the sample table, for example, the administrative role only requires the person there only when there are collaborations happening between the science institutions (UCT, UWC, SAAO).



## Interviewing

Clarke & Dawson (1999) argue that the purpose of qualitative interviewing is to capture experiences, understandings and perspectives of those being interviewed. A qualitative interview seeks to find out what the person thinks, feels, knows, why, and how they come to know what they know. This intimate knowledge is enhanced with face to face semi-structured interviews, which often enabled me to encourage my interviewees' general reflections and seemingly digressive thoughts. These were all valuable in generating in-depth insights into different facets of women's work experiences at the SAAO.

In this case, semi-structured interviews were selected and conducted in English as all my participants were fluent in English. I therefore had the assurance that none of the

participant's narratives could be compromised by aspects losing meaning through translation.

All participants were sent the information sheet (*appendix 1*) and consent forms (*appendix 2*) well in advance in order for them to familiarize themselves with my study purposes and to give them time in advance to affirm participation or withdraw from the study. The interviewing phase started from the 1<sup>st</sup> May 2016 and the last interview concluded on the 20<sup>th</sup> of May. Each interview took place at a convenient safe place and at a time set by my participants.

I travelled between the University of the Western Cape, the University of Cape Town and the South African Astronomical Observatory for my interview appointments. On the day of each interview, I would then insist that they go through them again in my presence before signing so that they are absolutely certain about wanting to take part in my study. I read out some of the key issues, one being the emphasis on my request to record verbatim our entire sessions, and the need to inform me as soon as they were uncomfortable or did not feel comfortable answering a particular question so that I would be aware and proceed with the next.

I noticed that my participants found the environment safe and inviting to discussion, and often spent vast amounts of time opening up and voicing out what had long been suppressed. For people that I had only just spoken to a few times via email exchanges and had just formally met on the day of the interview, it felt that they had long wanted an opportunity to have an outlet and to air concerns that were usually suppressed. Although masculinist research is often expected to be unemotional and rational, it is noteworthy

that both the participants and I found our interchanges quite emotional. I believe that this expression of emotion in addition to content is important in qualitative research, and enriches the feminist researchers' sense of the depth and angles to understand certain experiences.

The interview recordings ranged from 1h: 20min to 2h: 07mins with the interview questions grouped into sub-themes (*appendix 3*). The questions that were asked ranged from institutional culture and hierarchies, institutional analysis, gendered dynamics and staff experiences. The purpose of these subthemes was to generate more underlying factors that would emerge from their own understandings and analyses of the SAAO. Furthermore, the implications of their different responses led to further explorations of their experiences. Much of what informs chapter four and five's discussions emanate from this section. The perceptions, attitudes, opinions and beliefs about institutional cultures, insights on how hierarchies form, the meanings derived from their interpretations of their institutionally bound worldview were unpacked in this section and further discussed in the following chapters.

## **Memo Writing**

According to (Coghlan & Brannick, 2001: 33) journal keeping is a significant mechanism for developing reflective skills. What this means is that, you take note of your perceptions and encounters in a diary or journal and after some time figure out how to separate between various encounters and methods for managing them. I found this extremely valuable in developing my ability to conduct in-depth qualitative feminist research. Many indirectly conveyed views, emotions, or forms of body language surfaced in interviews,

and I found it important to reflect on these through journaling. Diary keeping helps you to ponder encounters, perceive how you consider them and expect future encounters before you attempt them. It was also important that keeping a diary allowed me to maintain a focus and capture the fullness of described occasions or views before the progression of time distorted my views of them.

I always brought my journal to the field as an essential research aid. I recorded some notes, and those non-verbal cues that my participants would subconsciously send out. In between the questions, whilst the recorder was running, I would sporadically make notes of what had struck me, which I thought too was useful to my data.

Some of my most profound reflections were recorded here, especially when at the SAAO or if interviewing elsewhere, I would then wait to leave the office and quickly find a place to sit, have a debriefing session with myself, and write down reflections whilst they were still fresh and vivid in my mind. The intention here was for me to not rely solely on more conventional forms of data-capturing, but to have a contingency plan should technology fail me, and to document the fullness of events as they unfolded.

## **Observation and Reflexivity**

Observation is key to feminist ethnography although it is a method that can be used with any other forms of data collection as observations happen almost naturally in the course of conducting an evaluation. Participant observation can be an especially valuable form of qualitative research. Observing as a participant is a fieldwork strategy that involves the evaluator entering the social universe of others in order to provide a full and detailed



account of what is under scrutiny. As previously stated, my co-supervisor's connection to the SAAO allowed me to immerse myself in some of the wide ranging work activities of the observatory. As a result, my part in the investigation as participant observer was completely overt. Most employees at the observatory were aware of my presence and purpose in their space.

One of the challenges of the feminist methodology I used relates to how I sought to maintain my personal awareness of how my role, subject position and feelings would be connected to what I observed and recorded. Lewis (2012) refers to reflexivity as an awareness of how the researcher in a research milieu is influenced by the same power relations that affect those that are researched. Awareness of being subjective or self-reflexive in feminist research is something that is completely unavoidable, and requires one to engage with rather than to try and ignore. Harding (1993) discusses this well when she insists that the reflexive process requires the investigator to make herself as well as her participants and field the object of knowledge-production.

Who I am as a person, a researcher, a woman, a feminist, and a humanities and social sciences gender studies student investigating a natural science arena will always be central to my research. Reflexivity is about acknowledging the central position of the researcher in the construction of knowledge (Banister *et.al*, 1994). I was confronted by moments that needed me to be reflexive and not cross the ethical boundaries required by a study that analyzes women's confidential knowledge and experiences. As a researcher, one has more power than the researched, and study participants can easily be directly or subtly exploited.

In one instance an interviewee offered to give me a work email that had been circulated by the department declining attendance to a gender-related event. What she verbalized in our interview about this could contribute to my analysis. However, by writing in detail about this email and her views, I would overstep ethical boundaries. Overall, being reflexive often heightens our awareness of the implications of our actions.

There were other moments during observations at the SAAO where I would feel completely displaced and powerless. During such times, I mainly kept to myself, greeting only those that took the initiative from having recognized me. Thereafter, I would bury myself in my notes, and behind my camera. There were other times where I would conduct observations at the social hang-out places such as *The Wild Fig* and *The River Club*. At both these spaces, I felt out of place: the aura was so ‘manly’ and unfriendly that again, all I would do was keep to myself and dine alone when it came to moments of ordering something to eat. Here, I was forced to have an introspective monologue about what it truly means to have an “insider” and “outsider” positioning as I do not recall ever having feelings that privilege me as an “insider”. This research proceeded with one perspective, that of the outsider looking in, only privileged by the experiences that I had been entrusted with, and this guided me to know my operational limits and the ethical implications that would be involved from any improper and unethical forms of writing or analysis.

I was also reflective of my other varying positions or roles in the field. For example, I realized that I would be perceived as relatively dominant in relation to the cleaners or women security workers that I would occasionally interact with although my status as a student and my identity as a black woman sometimes made me almost invisible to certain

staff in positions of power. I was often relatively reserved in my interactions, since this was a coping mechanism. However, for some of the women administrative and cleaning staff, I may have been seen as withdrawn. Generally, I also needed to recognize the relative vulnerability of certain women staff, and avoid being seen to interview them with my “gender studies” questions. There were moments of great power and again some of powerlessness.

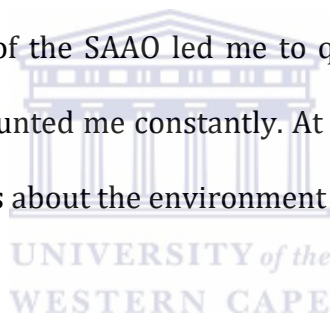
On the whole, I found the space one in which people tend to interact in formal and limited ways, as though their purpose in work involved denying aspects of their personality. Often I noticed that those who encountered me quite regularly would just walk by without greeting, unless my secondary supervisor was there. Again, these impressions could be attributed to my pre-conceived notions, beliefs and perceptions about this space. I am reflecting on them here, however, since I believe that it is important for me to reflect on my other experiences of working spaces, and reflect on how my experience leads me to a comparative understanding of the distinctiveness of the SAAO, relative to other working spaces I have experienced as a black social science woman student.

Armed with the knowledge of how easily the personal can be infused with the political, I was also cognizant of my other parenting role as caregiver to a four month old baby since the beginning of FMF protests when I moved in with a married couple (friends). This often left me as primary care-giver, and I was able to make experiential sense of the challenges that many women face in the workplace.

I believe that my self-reflexiveness and observation also gave me some insight into the experiences of other socially marginalized subjects at the SAAO. During my various visits

when I would regularly face the SAAO's colonial artefacts, paintings of white male scientists, and general air of exclusivity, I often felt consumed by deep feelings that I never could articulate in words to people. All I could say in an attempt to be descriptive about my daily experiences was "It's a feeling of not belonging, I just don't like the space, it's unwelcoming". It was often only during the time I spent with my participants during interviews that I had a light bulb moment when my own disquiet tapped into their own feeling and they labeled this feeling 'imposter syndrome'. I had finally found a word that could best describe my own feelings about the space during the time spent at the Observatory.

The extent to which the aura of the SAAO led me to question my right to inhabit the observatory as a researcher haunted me constantly. At the same time, it inspired me to ask questions about what it was about the environment that made me feel as I did, and a desire to conclude this study.



## **Data Analysis**

Analysis of the results will follow the recommendations of (Bless & Higson-Smith, 2000) and in some other instances borrow from (Camic & Yardley, 2003). According to Bless & Higson-Smith (2000), qualitative data provides a variety of options of analyzing and representing the data but the study has to be systematic. This is to ensure that the process is as valid and trustworthy as possible.

This study uses thematic analysis for analyzing the data. Thematic analysis occurs when themes and concepts of the coding are derived from the data itself. This requires better

understanding and knowledge around the scrutiny of raw data, the repeated reading of the transcripts, journals and other notes for the most similar and dominant headings and categories derived from the data itself by recognizing and describing coded and identified patterns and themes.

In developing my thematic analysis, I broke down each transcript in search of similar responses. I then further organized sections and sub-sections within broader categories. This form of analysis not only complimented my feminist research framework but contributed immensely to how I was able to generate rich data whilst simultaneously constraining me to focus on the highly probable themes that were recurrent in my transcripts.

## **Ethical Considerations**



The University of the Western Cape's code of Ethics guidelines from the Humanities and Social Science Research Committee were used and attached to the appendices section. The Ethics Guidelines are there to inform participants of their rights, and to guide the researcher's method of the correct and ethical way of doing research.

Ethical considerations are of vital importance in relation to one's participants and to ensure that no improper conduct potentially harms participants. One major ethical concern in the study was to think carefully about the risks involved in a study of this nature that would require relationships of trust and sensitivity towards women whom I wanted to divulge details of complex work experiences. I had to be especially mindful of the realities facing women in this field and the fact that there are so few women within it.

I also needed to ensure that anonymity would not be compromised as the study I produced from my research on participants' views would be public. I tried to take these factors of risk into consideration through, for example, ensuring that I found congenial sites for interviews, or avoided steering interviews in ways that made my interviewees uncomfortable. I also explored less risky ways of using the data, one in which their safety, anonymity and confidentiality could still be realistically attainable (*See Appendix 4 for Ethics Forms*). Since astrophysics and the SAAO have very few women who do not feel or experience discrimination, my participants and I jointly strategized about ways of protecting their anonymity.

Ways of concealing their identities to the best of my abilities was something we gave deep thought to. Ultimately, however, all participated voluntarily and freely consented and seemed to have a clear awareness of the potentially negative and positive aspects and consequences of partaking in this study.

As previously mentioned, the study makes use of photo-images, although no verbal information was taken from the people that appear in the images collected. These images were taken with the consent of the subjects and their understanding that they would appear in my final study submitted as a mini-thesis to the University of the Western Cape. In trying to take feminist ethics fully into account, I also stressed that the analysis of these images would be my own, and would not in any way reflect the views of the participants, or rely on any interpretation provided by those captured. All ethical protocol was observed and they voluntarily allowed me to capture the images in their presence.

## **CHAPTER FOUR: ALIEN BODIES IN MEN'S SCIENCE: WOMEN AND SOCIALLY MARGINALISED GROUPS AT SAAO**

As indicated in my literature review and theoretical framework, my analysis of the SAAO takes into account the positioning and roles of women's bodies and women as subjects as well as the ways in which gendered meanings and representations are normalized in ways ranging from building design to work attitudes and relationships. This chapter focuses primarily on the embodied experiences of women. It will be shown how their context positions them as worthless bodies in a scientific world that values the mind as masculinized.

It is worth noting that biological determinism, even in the present day, generalizes about the distinctiveness of women's brains relative to men's, arguing that women are cognitively not suited to certain fields. Investigations have gone as far as to allege that this is due to women having vast amounts of estrogen instead of the high testosterone volumes found in men (Fisk, 2011). However, feminist and social constructionist studies have shown that these are myths that are supported by cultural and societal constructs. Because the SAAO is an institution that celebrates masculinity, female bodies are often seen as foreign bodies in a space where they do not belong.

### **Imposter Syndrome and the Leaky Pipeline**

According to Clance and Imes "impostor phenomenon is used to designate an internal experience of intellectual phonies, which appears to be particularly prevalent and intense among a select sex-role stereotyping appear to contribute significantly to the development of the impostor phenomenon" (Clance & Imes, 1978:1). Feelings of having achieved the highest qualifications in academia and still not being enough give rise to a

confusing cycle of 'doubt'. This cycle of doubt is interpreted as the impostor syndrome and can further lead to the "The Leaky Pipeline" or "Greasy Pole"

The impostor phenomenon is one theme that ran through all interviews with my participants, and much of this drew attention to the affective and emotional consequences of the conditions under which they work. All participants indicated an understanding of this phenomenon, admitting to having experienced feelings of frustrations, inadequacy, self-doubt and anxiety at most times in their careers due to the how domineering males are in this field. They also testified to the deep assumption that women are associated with the disparaged worlds of feeling, bodiliness and reproductive ability and work, and simply do not belong at the SAAO.

Participants reported that they would often be faced directly with feelings of not belonging, and at times internalize this in the form of the self-doubting voice in their heads which basically translates as: "I am not good enough or smart enough to belong there". This is despite the fact that three of the interviewed women obtained PhD level qualifications. Of the four women that were interviewed, three of them had obtained Doctoral Degrees, and one had reached the status of Professors in the field of astronomy; yet all felt that the metaphors of being an impostor or climbing a greasy pole explained how they were perceived and how they sometimes saw themselves.

Loosely translated, a greasy pole would disable and pose challenges to anyone that attempts to climb it. The greasy pole in this instance is symbolic of the field of science/ astronomy where women experience enormous challenges with climbing the greasy pole of the field of academia. McDowell (2011) talks about the especially difficult challenges



resulting from the 'greasy pole' in the sciences linking it to a body of feminist scholarship that explains how women confront glass ceilings or overt discrimination in workplaces, academic institutions in this case. For one, the system's structural challenges always work to disadvantage women, whilst another burden is proving yourself worthy enough for the system to retain you.

The impact of the greasy pole and leaky pipeline are to intimidate and foster great doubt, with this in turn giving rise to poor self-esteem and lowering one's confidence levels. This often occurs despite the fact that many women are in fact perfectly capable of excelling in certain fields. These feelings are counter-productive and are esteem killers for women.

The following narrative directly speaks to this:

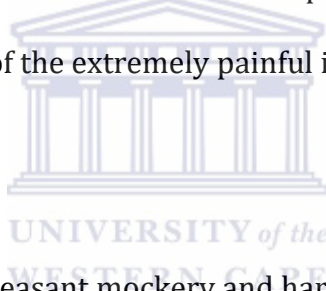
*"It's like a pyramid where cute young things are tolerated and as soon as you acquire a little knowledge to be threatening then somehow you get weeded out. The weeding out process is complicated the whole theory of this is called the "leaky pipeline". I don't know if you have come across the leaky pipeline. Go look it up! This is like the number one theory about why there are so few black and women and diversity at the higher levels of science. In terms of this leaky pipeline theory it's complicated why people leave this field but nobody wants to take responsibility for it so they always blame the victim. (Participant #3).*

What the participant refers to in the above statement are the gender barriers that confront women in academia. Within a scientific domain which has a very hostile and inflexible nature, these are often insidious barriers that drive many women to eventually abandon this field. Another participant spoke about how women experience this even before they properly begin their careers, in other words, with their first introduction into the masculinist world of science:

*"You are so aware of this kind of 'leaky pipeline' that exists where you are in the field but situations are forcing you to drop out. 'Leaky pipeline' means that you essentially have streams of people coming in to study a particular thing-in this case, science...Essentially when you come into 1<sup>st</sup> year of a degree, then you have a lot of women who are in your class. It's not 50/50 but it's not too bad and the thing is that at each level the people that eventually graduate in say physics or whatever, the number of women will be less. So you've*

*got a pool of people that are coming through who are then gonna do postgraduate so in each level say Masters or PhD the numbers go down but for women they go down more substantially. The thing is once you get your PhD it's all great but how many people go to do their postdoc and then postdoc so there is a well-known graphic which is like number of women that are getting permanent jobs, and then your fertility is going down. So the leaky pipeline refers to basically not being able to retain women that are being trained to be astronomers in this case" (Participant #3)*

The scientific world, especially the prestigious world of astronomy, links value, excellence and competence and superior mental ability to the male body and manhood. The inflexibility of this situation means that even when women do conform to masculine behavior as discussed in a later section, the female body continues to be defined in terms of stereotypes that link the female body to intellectual weakness, irrationality, the “messiness” of having a body that menstruates and reproduces. Participants testified to these assumptions in the form of the extremely painful insults, innuendos and jokes that are often made about women.



Some women reported the unpleasant mockery and harassment they are subjected to in this field, as women, and as mothers. For example, it was stated that when women get pregnant and take time off for maternity purposes, the males pass derogatory comments, which insinuate that they are not fit enough either to be in the field or to practice. Again, these forms of subtle bullying can have long-term effects on the psyche of the individual on the receiving end of insults. The long term ramifications can lead to self-doubt which can escalate and eventually lead to a person deciding they are better off at home, as their now trampled on psyche and self-esteem might be telling them that's one area they are naturally experts in.

The quotation below speak directly to forms of sexist and discriminatory remarks that women are subjected to in terms of essentialist views about their bodies:

*“Taking a year off after giving birth would be seen as a stigma that “oh, you couldn’t hack it, you are a female you wanna be like us guys and when you have a baby you take a whole year off”. There is just a whole lot of male hazing. Men are not really socially skilled, so often times, they will say things that are incredibly rude like that “like ooh you got that extra year cause you got a baby”. (chuckles). They don’t get that yes I got that year cause I had a baby and had to take care of that baby in addition to writing papers etcetera so that’s the science culture”***(Participant #3).**

Another participant described how women are regularly objectified in the jokes and remarks passed about them:

*“It could be beauty, appearance, age. It could be size tall, short, boobs. Another visual dominance thing in physical sciences is that women with bigger boobs are related to being less scientific than women who were smaller cups or smaller or flat chest that are perceived to have flatter chests. I have interviewed women before around this and they said they hide. They wear reducer bras to hide their breasts”* **(Participant #4)**

The above quotation demonstrates the inflexibility and the desperate lengths that women resort to in order to gain respect, acceptance or credibility. One of the observations that I made about women working at the SAAO is that the majority of the female astronomers seem to adopt certain gender performances so as not to draw attention to their “femininity”. Though the women that work in administration often dress up and wear make-up, I noticed that the female astronomers do not do this. In view of their deep awareness of prejudices about “feminized” bodies, I often felt that this was not always a matter of personal choice. It was as though masculine standards about where the female body belonged played a significant influence in their own attitudes towards their bodies. This was also manifested in the women’s astronomers’ body posture, style of walking and sometimes even the style of speech.

Antony (2007) refers to this phenomenon as the masculine century, and at times the masculine cult. Antony conceptualizes the radical shift in social order as the age of aggression whereby it is the women that have come to internalize the virtue of man and how men are perceived as inherently powerful. As a result, some women are eager to cultivate the male mind, character and all that is associated with power in order to achieve partial privilege as it is usually adorned to men. Antony, argues that it is this phenomena that often drives other women to imitate male behavior with some adopting some of the most aggressive aspects of masculinity.

The controlling of women's bodies at the SAAO is something that is not obvious, but rather manifests itself in oblique ways. Just as some women sometimes seemed to overstress their not being feminine, some women seemed deliberately to perform extremely conformist gendered behaviour. For example, as a way of finding acceptance in this space, Participant #3 spoke of how she would dress up and look beautiful, whilst at the same time strategically trying to find middle ground. What is noteworthy about her remarks is her struggle to work within a highly gendered space on her own terms. It is highly doubtful that men in her position experienced anything approaching the thought that she (and probably others in her position) pay to their embodied selves:

*“you constantly being reminded that you are the only woman there or part of the very few people that are there and because you are not used to seeing.... Well I guess it the function of being in a male dominated sort of subject. And this is one of the things that I would do; you find that I would dress up for my talks because this is what makes me feel comfortable. If I feel that I am at least presented well then that gives me more confidence and I find that to be very important. Like I want to stand out. I want people to remember me and I will do that in any way I can if it's not gonna be about my science then it's gonna be about 'because I was having a great hair day' (laughs)” (Participant #3)*

## The Patriarchal Demands of Everyday Life at the SAAO

In a patriarchal and male-centric society, women are generally expected to take up most of the domestic responsibilities, that of minding the home and childrearing. Obviously, for women who are working in the public sphere, these are often strenuous, time consuming, and unpaid-labour expectations that have negative effects on their careers. Much research on career advancement and women's experiences draws attention to this. For example, Pew Research Center conducted a survey on working mothers and career advancement and the findings demonstrated that women continue to bear heavier burdens when it came to balancing family and work life. As a result the study found that women are always the ones that struggle to get ahead and that it was likely the mothers more than the fathers would go through career interruptions likely to stem from family-related interruptions (Parker, 2015). Interestingly, out of the 4 interviewed participants consisting of an astrophysicist (51), research astronomer (34), administrator (35) and post-doctoral fellow (30) only 1 is married, and all these women have reached the age of thirty.

This pattern makes it hard to know whether women have voluntarily chosen not to have life partners and conventional families, or whether the responsibility of their work and the extreme pressure placed on them to perform simply makes this impossible. It is noteworthy, however, that similar trends were not evident among the men that I observed. Most were open to working flexibly and generally demonstrated an ease with managing their private and work lives. What was therefore clear was that they are cushioned by the presence of persons and arrangements that allow them to invest much more energy and time into their work lives.

It is significant that even though only one participant is married, all these women had domestic responsibilities required from their own homes , or their family homes where they had chores to take care of or children, extended family members and pets to mind. The striking inequalities that exist for women at the SAAO whilst men tend to be exonerated from such responsibilities are captured below;

*“Something that I noticed with male colleagues is that they will often be quite happy to move even if they are attached and have children simply because there is always the mother who keeps it all together, when the moves happen often initiated by men, the mom has to keep it all together. Find schools and whatever and that’s the thing; you’ve got that person there that’s going to sort of keep the family together and what happens if you’re the person that’s causing the family to up and move? Then you like ‘I’m taking my family and I am uprooting them and straight away you feel that you are doing them a disservice because you think ‘oh it’s because of me.... Male colleagues do not have that problem. They say ‘well, this is my job and we gonna move’ and that’s how it is whereas we gotta think twice or three times or five times to do that same move if you are a mother because you will think about how you are uprooting everybody and you will take it a whole lot personally.”. (Participant #3)*

The above quotation bears testimony to the hardships that women face, particularly in environments of higher learning and scientific research. At the SAAO the impossible demands of work-and family life basically mean that it is one or the other, and few ambitious women attain the balance between the two. It should be noted here that the field of astronomy as epitomized by the SAAO is highly competitive. It often requires its employees to seize opportunities and make quick changes (including research trips, temporary or permanent relocation) in order to ensure promotion and demonstrate their worth. This situation therefore makes sites such as the SAAO different from many higher educational institutions, where employees are less pressured to make abrupt changes to ensure promotion and similar rewards. This is clearly revealed in the following response:

*“There is this idea of working odd hours is very much part of astrophysics culture so that’s number 1! Then number 2 is in terms of women and men...for men it’s expected that all of*

*your basic needs are going to be met so that if you do have to work long hours there's actually somebody at home who keeps everything else running for you so it's really set up for a male lifestyle. A male lifestyle that doesn't have any family duties so if you have a child or something they don't really expect to see any difference in your work's flow or your work days just because you have a child, right. So a woman cannot have a child and continue to maintain those long hours but it's expected that the men can. So just in terms of child rearing that is the number one standing difference especially here in South Africa... So this is a huge bias in expectation. I mean the expectation is that somebody else is there to take care of your kids whether you are male or female. That you are always gonna maintain those long hours"*  
**Participant #3.**

In the SAAO context, workplace inequalities stem from a number of factors, and various biases always leave women in compromising situations especially with the realities of everyday burdens of domestic responsibilities. These work responsibilities mostly fall disproportionately on women: whilst they are expected to keep up the pace with their male counterparts at a professional level and as scientists, astronomers, astrophysicists and so on, they are expected to fulfill certain nurturing, care-giving or reproductive activities as part of their professional work descriptions as per their signed agreements with their employers.

This quotation gives evidence of this: *"What I've observed here is that, all the astronomers, their support staff, their immediate person they need when they want something done is almost a 100% a woman. When they need to travel, phone-calls, it's all women so there is that gender dynamic of again, a symbolic wife who's taking care of all the details so it's very much traditional gender roles in that way. The lead librarian is a woman and moves into those traditional gender roles. That doesn't mean those women are powerless, that they are powerless but they are still subordinate to a great male power"* **(Participant #3).**

Frequently, women deal with undocumented fine print details which require them to go beyond and above the call of duty, meaning traveling for instance, giving time to other special projects whilst tending to the everyday office responsibilities plus the not so spoken about management and duties of the home life. These responsibilities, which basically constitute invisible labour, do not fall on male colleagues who are exempted from domestic-type activities both in their personal lives and in the workplace.

These multiple identities or roles that these women have to assume are all demanding and are emotionally and physically draining. However, in a highly paced masculine cultured environment like the SAAO, there are no spaces or opportunities to advocate for these issues, or even name them. As a result no leeway is made or extensions granted in lieu of other responsibilities done or time worked outside home.

The demands and challenges that face women often come with a lot of sacrifices. Some women in this field start to compromise their hopes of aspiring to fulfilling personal or domestic lives since the conditions under which they are meant to perform place such unreasonable demands on them as fully rounded human beings. Even those that do date mentioned that dating has only been possible with men in astronomy who have an understanding of what they do and the nature of the irregular work-hours. As a result, only one of my participants was married, and even the married participant married someone from the field.

*"I think it's a very difficult situation.... You working at all sorts of hours, you working on weekends and it's just not very conducive to fitting into the role that people see for women. So you gotta make a decision...This is the thing, the sacrifices are not going to be equal so you kind of have to choose between doing two things and think half the time that you not doing either of them particularly well or you know, choosing one and saying that's my choice, I stopped doing astronomy or I decided to continue and decide if it will be easier or not to have children. It's a very difficult decision to make for all of us. Because we move around fairly a lot in this field, it's hard to maintain relations or friendships ....At what point does one make a decision? It's a very stressful thing to do". (Participant #3)*

The above excerpt highlights some of the serious life-changing decisions that women that work in this field have to make and how these often come with critical sacrificing of areas or aspects that women might otherwise feel strongly about. The expectations in this field are that women deliver on their operational plans and tasks to meet the SAAO's



objectives. The reality that my research shows is that women that work in astronomy can never realistically achieve work-life balance.

It is important to stress the extremity of the pressures on women in astronomy, relative to women who work as professionals in the higher educational field. The considerable psychological, emotional challenges that women face are often extremely difficult to measure or quantify. Moreover, in a field of science, where everyday practices are constantly presented as neutral, objective, coldly clinical, there is often very little opportunity to name, let alone to act on an emotionally draining patriarchal environment, particularly when this environment constantly defines the emotions and feelings as soft, feminine and irrelevant to the “work at hand”. The following quotation demonstrates just how expressions of emotions are ridiculed and vilified because demonstrations of showing human signs are considered a deviation from the scientific norm;

*There were many times where I felt I was being taken advantage of which is somewhat in my personality so you sort of reach a stage where you say “well I am gonna do this anyway” and I am still gonna retain who I am so a bit of it is a selection effect where people can make the switch to getting tough skins...I still cry but I think that’s fine cause that’s just me I am going to get emotional about some things but a lot of people will be like “oh you gotta get a tougher skin”.*

As will be demonstrated in chapter five, the complex visual, behavioural and symbolic ways in which the SAAO and the world of science pathologizes the world of the emotions is crucial to an analysis of women’s experiences and to its overall gendered character.

## **Neglected Gendered Values**

As various feminist social constructionists have shown, values are learned through ongoing processes of gender socialization. I have suggested that the norms of efficiency

and “objective” non-emotional work have become hegemonic and normative at the SAAO. The implication is that no other values exist, and that the world of science inevitably has to accept these norms. It is in fact disturbing that many women who work in this field internalize this view and accept the assumption that they should not show feeling and should aspire to masculine codes of conduct. Even more disturbing is when women internalize masculine values to the extent of exaggerating their ability to fit into and conform to a “man’s world”. The material rewards that women seem to receive from doing so are considerable, even though the psychological effects are disturbing. One manifestation of women’s internalizing of masculinized values is cronyism and bullying.

The data strongly revealed a trend of bullying, infighting, competing, and blatant sabotage inflicted by some women who have seemingly thrived and ‘made it’ in this field. These are women mostly in senior and leadership roles within the field and are situated at the highest rankings of the organizational hierarchy. My participants stated that, often, women who are in senior positions and hold positions of power tend to act in malicious ways towards their subordinates. One participant expressed this in the following way:

*“One of the worst incidences, we know about it, everyone knows about it, we all talk about it it’s an open secret in astronomy is...I don’t know how to put it, workplace bullying, harassment. This woman here (pointing) she ended someone’s career with a phone call, a young woman and I heard a rumour that she wanted to do it to me. I don’t know about my rumour or the thing about me is unconfirmed but the other person’s-everyone knows about it” (Participant #1)*

It is noteworthy that women’s internalization of gendered stereotypes can be compounded by their internalization of class, racial and regional stereotyping.

*Participant #1* testified to this by saying:

*“So there’s that type of...um... how can I say...especially when it comes to females from abroad. They sort of look down on our people whether you coloured or white because you don’t have the same type of education that they had so it’s almost like they have to basically*

*teach you, you know, what you are supposed to already know. So it's not just males, there are females looking down on females. Especially those that have achieved, they are not helping them. Sort of like...I got here you know, I am not worried about you that's still coming up because I still want to go further. There is no helping the next person which is quite sad. The other South African female that dropped out she was white and she also dropped out and said no this is not for her”(Participant #1).*

Where matters relating to any 'gender-specific' talks or workshops or even home life are concerned, it has been reported that it is sometimes the woman in charge that holds back progress within this discipline. Participants referred to the fact that these influential and senior women would regard issues pertaining to gender and discrimination as wasteful expenditure and total waste of time that would not benefit the department in any way. It is often up to individuals to make the effort to attend certain events related to gender equity outside of the SAAO, and heavy burdens are therefore placed on individual women who end up trying to fight battles without any sense of community. One participant reflected this when she stated:

*“I feel like there is not a lot of emphasis put on gender disparities and gender issues. Things people face as women and the differences between being a woman of colour and being a white woman and those kinds of things, there is a lot of resistance when it comes to things like that and I feel that men aren't involved. That's something that does not happen in this field only but in general. I once went to this work-life balance event in North Hampton and there was like 50 women and 1 man. It does not get discussed here, work-life balance and most of it is spent on sorting out gender disparities and like I said, there is a lot of resistance from senior women whom you would think are more clued up and empathetic to work-life stuff”(Participant 1)*

The problem of senior women who dismiss the need to address gender inequality can legitimize male staff's conservative agendas. It creates the impression that when women voice their legitimate struggles they are covering up for personal weaknesses. In this way, certain women end up being isolated and 'othered' as 'the group that likes to over-react.' Participants often reflected on the lack of solidarity among women, and their experiences

of being dominated by women superiors. This is evident in the following comments from three participants:

*“The most difficult situation I had to deal with was actually having a female supervisor because she had come through this whole process and had to be really ‘tough’ and so her sorts of feelings was that the rest of us should be as well so it was more like a ‘tough love’ sort of situation. So there was little inflexibility when someone that you might expect to think that they will be more aware of the pressure, but in fact because they did not receive any suffering of extenuating circumstances they did not feel the need to pass them on and so that is often a very tricky thing for us as women in science, is that we don’t necessarily stick together okay. It can be quite competitive you know (chuckles). There is a lot of infighting so you have this terrible situation where people tend to judge each other very harshly” (Participant #4)*

*“There are women who are making it, who tend to sort of judge each other cause we don’t know who’s gonna be the next one, who’s gonna drop out and I think there is that sort of stress you know” (Participant #3)*

*“In academia, because you probably always worrying about whether you smart enough and capable enough, and having that extra layer is the real issue and it becomes really difficult when you put people together and tend to want to force them to talk about issues because you quickly find that it becomes very much harder for people who have kids in this situation and how it becomes more of a better environment for women, which is not quite the same as having a support system? How does one deal, how do you remove the competitiveness so that people can actually lean on each other? I think that’s a real worry cause if we cannot even help each other than how are we supposed to make any kind of change? How are we supposed to be strong and actually saying “actually we gonna stand up for ourselves”. I think you gain so much strength from other people. It’s intimidating! Yes, that the word I am looking for. We are easily intimidated by other women” (Participant #2)*

Mgcotyelwa refers to this kind of infighting as horizontal hostility. According to Mgcotyelwa, this kind of workplace hostility occurs when “Members of the same oppressed, powerless and marginalised group fight amongst themselves. They take out their anger, fear, lowered self-esteem, frustration and mistrust on those closest to them, those as vulnerable as they are and those who have equal or less power or status than them” (Mgcotyelwa, 2012: 76).

Yet other values are also expressed by certain women, and these often directly or indirectly challenge the SAAO's masculinized atmosphere. The work values and spaces that some women in this field seem to hold in high regard are: meritocracy, transparency, respect, honesty, grievance channels, and approachability. This shows that many women, even in intuitive ways, are often able to identify the political foundations of the SAAO as a repressive system, and have defined values that effectively constitute a potentially different working culture. The participants felt that there were not open channels that they could access in the event of disagreements or when they sought to resolve some of the work conflicts they may have experienced.

One especially telling indication of how women have identified the political injustice of the SAAO's working culture is through identifying the value of inter-personal communication, and the importance of valuing the individual. The following reveals this:

*"The most important thing is approachability. Being able to go and speak to somebody who is in a position of authority when you feel like you have a grievance or something you are not happy about. So one of the things I am acutely aware of is not having that outlet and sort of feeling more and more negative about your workplace because there is no way to resolve it. If you think about it, if you don't go tell somebody that you are upset about something then you don't give them an opportunity to make it right or to do something about it. So one of the things that I feel is really important is to be able to be open and frank with people that are high up and explain to them your situation and even if they don't sort of understand your situation, at least they can be able to be cognisant of it and sort of be aware that there is a person who is a person and is not just a job" (Participant #4)*

As this participant indicates, the world of science in general and the SAAO in particular, tends to define workers and employees simply as cogs in a wheel. Alongside the emphasis on the mind, and the separation of the body from the mind, there is an emphasis on the world of science being inhabited by isolated, solitary persons who should naturally not communicate with one another in human ways. By emphasizing the importance of the

individual persona and inter-personal communication, women are challenging destructive values that the scientific world has long defended.

The need for “approachability” as a valued trait by these women stems from their experiences of being confronted by high levels of aloofness from their male or senior female authorities’ who are hardly ever interactive or sociable. It is these interpersonal skills or lack thereof, that women value the most in this field in order to make the space more people-friendly, to give it some form of life and personality, and to make it more accessible. According to participants, these are traits that many of their male colleagues believe are ‘soft’, feminine and inappropriate to the field of science.

Related to this is a concern about the individualism that often goes along with being a good scientist. Many women scientists are more aware of the impact of their own opportunities on others, as the following reveals:

*“Well, things that I consider to be important are being a research scientist and a professor and I need to have access to certain resources. Like I need to have enough money, a lot of my research involves a lot of travelling so I need to have a travel budget. I need to have enough money to travel. I need to have enough money to support my students because you know of course that my students are making my field bigger” (Participant #3)*

Another important value that participants articulate is the importance of ethical standards. It is ironic that the world of science is often obsessed with academic notions of ethics. Yet women in this world often point out how profoundly disrespectful the domain can be to individual persons. This is revealed here:

*“Well things that are important to me aren’t things that are necessarily reflected here. But its things like, you know...transparency, honesty, meritocracy, things that I one would see at work. Not just at work but in their everyday lives. To be treated with respect, everyone wants to be assessed on merits that are relevant to whatever sphere they are operating in. You should be assessed on what’s relevant not things that are irrelevant like who you know and so on, spaces that adhere to that regard” (Participant #2)*

In addition to identifying values that the masculinist scientific world overlooks, many women identified the obvious political injustices that are often normalized at the SAAO. The participants strongly felt that this field's autonomous beings were male and expressed their frustrations of always being overlooked. This has meant that major issues remain suppressed and unresolved as the decision makers and those with the power to mediate ignore calls for appropriate mediation or conflict resolution. Instead they use the excuse that women are simply frustrated and venting because 'they are women'. Their genuine issues and struggles are then trivialized and reduced to whining because complaining is perceived to be stereotypical of a woman, as evidenced in the excerpt to follow.

*"Yes, so that's the thing it's almost like a two-fold issue, and I am speaking as a woman in science. You can often be in a place where it's obvious that nobody wants to hear about your issues or if you have problems or whatever it's like "whatever" "suck it out" so it can be very difficult to sort of acknowledge that you have something to say. You get the feeling that nobody wants you to do that. So being in a place where there is accessibility to people that are in authority makes a difference because then you can also become part of the solution, as it were so for example, if it's a grievance sometimes it has to get personal and that's often a problem because women are so aware of the fact that no one wants to hear our personal sort of issues but it's such an important part of who we are because men do not have the sorts of pressures or things to deal with because they are primary and there always tends to be someone secondary to whatever else is going on. So actually the personal factors are an important part to consider" (Participant #2)*

Participants expressed the wish that the job admitted people to their positions on merit only and in that way, they would also stand equal chances of occupying those positions. Participants therefore indicate how practices of de facto nepotism, discrimination and stereotyping are firmly in place, even though these practices are often obscured by the rhetoric of excellence or various other beliefs.

## The Feminization of Forms of Work

Highly feminized jobs associated with caring, looking after others and administration, are usually the lowest paid, and in this case it is only women that are often employed in administration and outreach. The feminization of outreach again disproportionately shifts the burden to women only, leaving them to sort out how arrangements tally with their other responsibilities.

The SAAO has social responsibilities linked to addressing broader social justice issues. These social drives are initiatives that many science-related entities pursue as a means to opening this field up, and making it more accessible to all, especially those previously marginalized. Some of these responsibilities entail driving campaigns and giving talks and presentations in High Schools in order to inspire and encourage learners to come into this field. The SAAO, as part of its social projects, also offers field visits for learners interested in this area of work, and an outreach specific person then gives these learners a proper tour and orientation.

Outreach for science forums and communities is understood and defined as an activity of providing service to a less fortunate group which does not have access to such services. Outreach is therefore an act of reaching out; it is a process or means of giving back and requires the work of persons with outstanding communication and interpersonal skills. For science communities the reaching out would be done through forms of 'bringing the science' to the schools. (McGill University, 2016). Communication and interpersonal skills are personal attributes associated with the work of care and nurturing such as nursing



and social work. It is well known that women are overrepresented in such fields, and this reinforces the idea that women naturally do well mainly in these areas and not others.

This assumption is evident in the following participant's views:

"It's interesting how for a male astronomer to say 'I'm going into outreach' people would think 'you couldn't cut it in research now could you?' but its fine for a woman to do...it's that sort of thing" **(Participant #3)**

A woman testified to her being forced into outreach work as follows:

*"I am actually right now in charge of outreach. I hate it. I never want to be in charge of outreach but I am the only one that knows what I am doing in terms of outreach"* **(Participant #4)**

It is a woman that spearheads outreach at the SAAO and simultaneously handles all aspects related to administration. Furthermore, even though my participants were differently spread out in different institutions outside the SAAO, they were all involved in outreach. Some felt comfortable about doing it, and some did not. But all revealed that they were expected to do this work because it was dismissed as inferior "care work".

Males do not really consider outreach as real work, or having any value. And the women who end up doing this work provide insights into its devaluation, as well as the devaluation of all other forms of caring work that women often do because they have been socialized in certain ways, or because they believe that – ethically speaking – concern for others is always important. One participant spoke about this in the following way:

*"I've got to do everything. From getting students nominated to seeing that they get paid, to seeing that they submit their thesis and play coordinator when there are and sort things at the observatory. I've got to play all those roles and its quite taxing because it means that you cannot reach everyone and do everything for a specific person you know, and when you fail, when things sort of falls through the cracks then you are the baddest person to be*

*around. It's like "she's not doing her work", "She's not performing" but yet, you've gotta do everything else around here because they are never here! That's the other thing. They are never here so I basically run the department when they are not here". (Participant #1)*

The enormous amount of work that women do in relation to administration, outreach and caring might suggest that this is a professional terrain that is 'owned' by women. Yet this is often not the case as there is usually a male superior in charge who disperses funds for projects to be rolled out, selects which population will benefit from a project and is the overall overseer of the broader project. Overall, women often do the hard administrative and outreach work and the men direct behind the scenes.

The entrenchment of gendered roles or gendered statuses in relation to the work done by men and by women is starkly revealed in attitudes towards women's research and writing. As indicated, women are often urged to perform administrative or supportive activities alongside their regular work. However, even when the "real work" as valued by the SAAO is done well, it is seen very differently from how work done by men is seen. The following participant testifies clearly to this:

*"The thing is...what I've discovered is that one of our female researchers writes up a paper and it's been published, you know... and eerrr...they do not get the same type of recognition like "good on you" as the male counterparts. Whereas if it's a man that has written a paper... It's like publicised everywhere you know, pictures of them put up everywhere, like "this and that got a Laureate Award" you know, but it's not the same for the females and I could not understand that dynamic. As to why it actually is that case because me myself, I am new in this field, you know, and I am still trying to find my place still here because you sometimes don't feel at home (shall I say). You cannot speak freely, if you do then it's sort of looked upon as "what are you talking about?" (chuckles) you know. It doesn't, like I said, carry any weight" (Participant 1).*

## Invisibilized Gender Discrimination

Much of my analysis has shown that the patriarchal status quo is maintained and produced because it is so dominant, and constantly presented as normal. As a result, few if any opportunities exist for reporting or acting on discrimination. I deal with the ways in which this institutional culture is supported and naturalized in the next chapter. This section, however, underlines the key ways in which this culture oppresses and marginalizes women as a foundation for the chapter that follows.

Martin (2013) conducted an investigation about the experiences that were felt by women who worked in male-dominated fields. The findings reported that, some of the formal and covert practices of discrimination and bias were deeply rooted in inadequate resources, biased policies and infrastructure. The study revealed that none of the study participants were aware of any of the policies that governed work relations or arrangements for employees' rights. One woman participant revealed the silences around justice and rights issues in the following way:

*There is favouritism here. There is cronyism here. There is a lot of resistance to change. Um...there is a lot of exclusivity. It's the opposite of inclusion so it's basically working towards exclusion of others with those that have gotten in and are making it making it hard for other people to get in and feel welcome. ...there is a lot of talk now about education, and decolonising the education institutions and decolonising curricular and things like that and for people in social sciences it's easy for them to think... "She must move away from old white men philosophy and Eurocentric views and afro-centric philosophies in an African space and do things differently." But science is a little bit less obvious, when you think about it. Not just science but when you think about it....in subtle ways." (Participant #1).*

Sabotage is another malpractice that is visible within the SAAO, even though sabotage is often rationalized by racist, sexist and classist assumptions about individuals' ability and performance. Many complaints of malpractice and sabotage are usually dismissed in the astronomy sphere, even though there is often recognition (however token) of the formal

policy requirement for South African organizations to address all equity matters and equality issues in the workplace.

Due to the fact that men hold key positions of power in terms of hierarchy levels and thereby control budgets and resource allocations, some of the most blatant exclusionary practices that the women mentioned were around resources. This control also often limits the opportunities of certain women and critical employees to pursue or make changes.

It is significant that once budget allocations have been done, or specific research projects are approved, there is also another process of scrutiny that needs to be undergone. Again, the benchmarks or parameters of excellence and accreditation are set by males. Women in this field and their work are often given lower ratings than their male counterparts. Additionally, women at times are not given funding opportunities, and since money or funding usually determines the power to carry out important work, the men that control the resources have the power again to decide if they will advance their research by allocating them support grants or whether they will decline financial requests as an unconscious or deliberate ploy to keep them in the same place so that they do not advance as quickly as they have done.

Green (2003), writing from an academic institutional perspective, details various forms of discrimination manifested in modern-day workplace. Green shows how obvious and direct forms of discrimination are increasingly being concealed by an emphasis on bureaucratic management and auditing, where “overt racism and segregation [gave] way

to ...well-defined, hierarchical, bureaucratic structures delineating clear paths for advancement within institutions” (Green, 2003:91).

The veiled discrimination that Green describes speaks to the state of affairs at the SAAO where discriminatory dynamics are not always identifiable. Women and other marginalized groups are often positioned in hierarchies where obvious forms of bias are disguised by ideas about, for example, efficiency or standards.

The excerpt below exposes how power is maintained when women are covertly excluded from crucial work related events as these are at times scheduled for the weekends when they obviously have other household and familial responsibilities to attend to.

*“At the same time they make things inaccessible. We had this meeting ... it’s like an AGM but for the astronomy kind of community and they scheduled it over a weekend and one of our senior women emailed and said this was unacceptable that it was a 2 day thing and that they were making it over a weekend ....t these conferences should not take place on a weekend they should take place during the week as they were part of the work”*  
**(Participant 2).**



The experiences of discrimination that women face in male-dominated occupations are often complex for men to even begin to understand. Yet they are profoundly felt by those on the receiving ends who often bear the brunt of being excluded in many subtle ways.

## **CHAPTER 5: EXCLUSION AND INCLUSION: THE SAAO'S INSTITUTIONAL CULTURE**

It is argued that members of organisations use special institution specific symbols and communicative processes to express shared values and these are produced and reproduced over time and these patterns are later transmitted into symbolic forms. The patterns usually consist of shared values, attitudes, beliefs, customs and patterns of language and thought, which then transmit into a publicly and collectively accepted system with its meanings operating as the culture of that group (Pettigrew, 1979).

According to Pettigrew, the dynamic involved in making sense of how institutions adopt a certain culture is influenced by the realizations of the organizational values, the symbolism hidden behind the artefacts, the interpretation and assumptions which are then informed by overall manifestations of the interplay. The observations conducted in this study which informed this analysis explores these metaphorical aspects and symbolisms which demonstrated elements of inclusion and exclusion at the SAAO. The symbolisms were then clustered in the four sub-headings that follow below;

### **Maintaining Binaries of Insider and Outsider**

The following quotation well encapsulates the functioning and impact of the SAAO's institutional culture. The participant, a senior employee and professor, testifies to her frustration and outrage, as well as her determination to challenge the status quo. As she also notes, however, the struggles is hard, and many women simply find the institutional environment too inflexible to fight or transcend:

*"I have learnt to work around it and the thing about it is that they infantilise you. Even if you are a visitor and you are an astrophysicist and you walk in, they will assume you are a*

*student. They will never assume that you are a peer. So they always talk to you as if you are a student and you have to make it clear that you are a professor, and you are published and you are an expert, you know! So you to like continuously... (thumps fist) "No you are wrong" and "No you can't speak to me like this" "I am better educated than you" "I am richer than you" and so on. The list goes on and on like 'no you are not gonna play that superiority card with me' so you can fight the fight and you can fight it gracefully or you can get tired of it or you can internalise it. The younger you are the more likely that you are gonna internalise it. They treat you like you don't belong and therefore you end up thinking that" (Participant #4).*

One of the challenges that marginalized groups face at the SAAO is the slipperiness of the way in which insiders are defined in relation to outsiders. As indicated in the previous chapter, gender discrimination is often articulated and acted on indirectly. The complexity of distinguishing between insiders and outsiders is well-articulated in the following quotations which testify to different kinds of exclusion. The first reflects how alcohol consumption and sociality at the SAAO makes those who don't drink alcohol into outsiders. The second conveys the classist neglect of a woman administrator as a "real" member of staff at a social event ostensibly aimed at cementing a sense of community among staff.

*"When you not part of the in group so that's a way to exclude people whether consciously or subconsciously. Now the people that are excluded are not just Muslims. We have a lot of people from other African countries who are very religious and they don't feel comfortable even going to a place that serves alcohol and you can say "oh its fine you can just drink coke" but the fact that you have it at a place like the UCT club...it's a place that serves alcohol and they don't feel comfortable and they will mention that according to their religion they should not even be seen in a place like that and that's their belief we should make it accessible, make it comfortable. Like right now there is a weekly journal club and they serve alcohol in it. It also serves juice but it could make people uncomfortable because people are consuming alcohol in your face. Personally I don't think that's right. I feel it excludes a whole lot of people and it isn't the way to socialise. Then when you try to organise a lady's night out just as a social cohesion practise and to try [to] unwind after as women alone who work in this male dominated space, even that too is never met without contestation and backlash" (Participant #2)*

*"Well! I think, we were at 2 to 3 end of year functions and what I could assess from that is that they don't really come and speak to you. You as an administrator would sit there on your own and they would not come and talk to you, they look down on you and they speak among themselves. Because you know! Maybe it's because I don't have a degree in what they*

*are studying, and they sort of exclude you because they think you won't understand what they are talking about you know!"(Participant #1).*

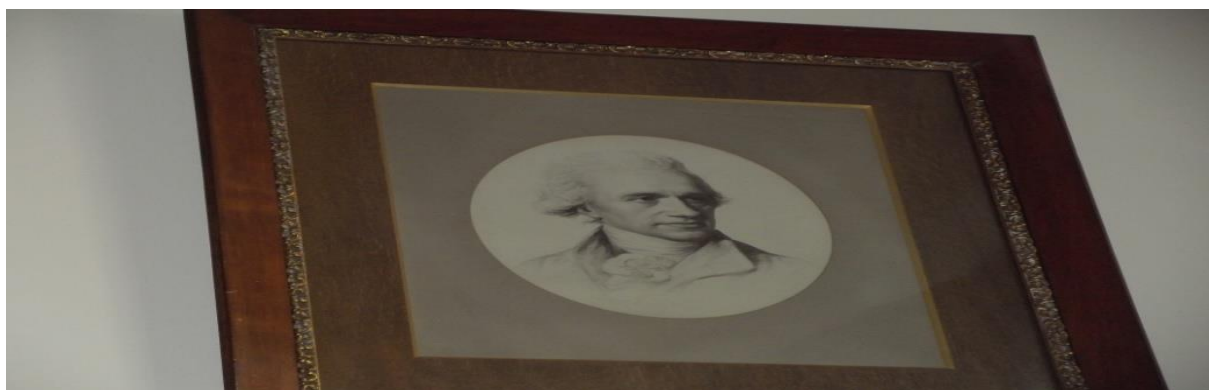
The literature on professions, science and knowledge demonstrates the useful concepts of understanding boundaries and offers significant understandings as to why professions come to be distinguishable from one another for instance, the science from the non-science, layman from experts etcetera, and how these previously mentioned systems of classification emerge to inform a collective identity amongst members of a group and within an organization (Lamont & Molnar, 2002).

Lamont & Molnar (2002:12) maintain that the “focus on sociological boundaries prompts researchers to develop a relational and systemic perspective on knowledge production sensitive to historical processes and symbolic strategies in defining the content and institutional contours of professional and scientific activity. The notion of boundaries is also an essential tool to map how models of knowledge are diffused across countries and impact local institution and identities through their circulation of knowledge and information across social worlds”.

The boundaries of insider and outsider are powerfully marked through décor, furniture and paintings at the SAAO. These are invariably gendered, but they also mark boundaries between bodies, values and cultural resources. The artefacts at the SAAO signal a particular history, and seem totally out of sync with South Africa in the twenty-first century but are essentially an adornment of an ancient history that upholds a certain kind of culture that is not entirely representative of a multi-cultural, multi-racial, multi-class and diversified institution.



Some of the ways in which the SAAO maintains the insider-outsider binary is manifested in symbolic buildings, paintings, artwork, etc. where these symbols take on a meaning approach to shape how things are done culture. Pettigrew (1979) defines artefacts as visible and tangible results of activity that translate into symbols. The symbols are then classified as anything that represents a conscious or unconscious association with a much wider and more abstract concept or meanings. Therefore, this chapter explores the meanings behind the material and immaterial symbols found at the SAAO in the following ways;



This image of an antique furniture book-shelf and a man situated at the centre of the book-shelf. The man is a symbol of power and rule as “man” is strategically placed at the centre of knowledge, bearing all the power.



The images found on every wall at the SAAO bear visible markers of a colonial past. The colonial art that is part of the observatory is a stark reminder of the fraught history of the Africans whose own histories have been erased through a legacy of colonization, characteristic of displacement, segregated, alienated and excluded. This is precisely what the artifacts and interior of the SAAO perpetuates, the history of Africans here is devalued and invisible. This space does not only convey exclusion by denying Africans their existence or the remembering of their past, which left them landless and dispossessed in order for the SAAO to exist, this space is to the detriment of women who too are invisible as not a single image on the walls existed. Therefore, the only history that is remembered at the SAAO is that of the White, non-South African male.



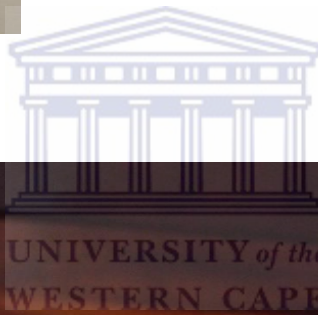
The historic paintings found at the SAAO represent a turbulent colonial era together with the architectural design of the building, which will be further discussed in the following set of images.

These images and objects are what fellow Black Africans in particular perceive as a sore point and burning symbol of a colonial regime with the colonizer perceived to be the ‘White Foreign Man’ found on the picture that they cannot identify with them or any of their struggles and issues. The SAAO needs to do introspection in order to reflect on the relevance of these images post three centuries later. These images may potentially propagate hostilities and instigate conflict between those whose cultures has been reduced to non-importance over those whose histories are glorified and put on a pedestal in this space.



The antique wooden stair-case is also a symbolic of the 18<sup>th</sup> century regime and colonial power. These epitomize colonial structures.

Various artefacts, decor, paintings, clocks and papers function as an archive, and work to create certain memories of the SAAO. These memories anchor its present in its colonial history, and it is as though the present success and growth of the SAAO cannot be thought about without fixated references to a colonial, masculine and elitist past.



Different time sets or wall clocks were located at every section of the SAAO



A method of keeping time (1) used particularly for observations

The obsession with time-keeping in this space is tied into the Western-centric, colonialist and masculine and traditional linear notions of progress and productivity. The numerous clocks and timepieces function partly as museum pieces, but also as symbols of the productivity and scientificity of the institution.



Sundial: An old method of keeping time, date and month that was used.

Science has often been defined in linear and unvarying ways, which actually fail to give accurate accounts of how the world of science works. The problem with the failure of accurate portrayal of how things in the sciences work is that it fails to grapple with the reality that the everyday lives of scientists are deeply entrenched in multiplicities of activities from the work they do, the many different activities they perform and all at different sequences.

The general assumption is that scientific methods are simple, unvarying and linear with the work mostly done independently. The linear scientific realm implies that science concludes. However the reality is that science too depends on human interactions at different times. This dynamic interplay cannot simply be observable under a microscope but is rather unpredictable, felt and shared through experiences. Therefore, what is arrived at as a conclusion is relative, revisable and ongoing.

([www.understandingscience.org](http://www.understandingscience.org)).

The following set of images draws connections of the symbolization to the ways in which the SAAO functions as an archive of colonial relics that function as constant reminders of white, elitist, western identity that has been preserved and imposed to Africans. The holistic imagery and visual impressions found at SAAO carry meaning and historic reminders of identity, culture and sovereignty of Eurocentrism.



This was an old method of borrowing study resources at the SAAO. These issue/borrowing cards date back to the late 90's while others date back way earlier and some go up to early 20<sup>th</sup> century. The preservation of these cards could symbolize an underlying meaning of somewhat needs or importance of holding onto the master's trusted tools.



The books symbolize the wealth of knowledge the SAAO has and how scientific methods are preserved.

### **Performances of Masculinity and the Creation of Institutional Culture**

*“The culture here is based around alcohol! With incidences like sexual harassment and things like that happen. Issues like that, I feel like you need to be mindful because you have the intersections to look at. You have people coming from a Muslim background. Those social events are not right for them, not part of their culture, inappropriate to them and may make them feel uncomfortable” (Participant#1).*



The testimony above reflects the way in which “staff” social events revolve around what feminist constructionists, drawing on Judith Butler, have defined as performances of gender. As studies of masculinity in South Africa have revealed that differences between men and women are social conventions, which are acted out differently, each time. Butler asserts that “just as a script may be enacted in different ways, and just as the play requires both text and interpretation so the gendered body acts its part in a culturally restricted corporeal space and enacts interpretation within the confines of already existing directives” (Butler, 1988: 526). Therefore gender is determined by how one behaves and this is also partly connected or influenced by an already existing body of directives, and within the SAAO the performance of masculinity often involves an almost compulsive display of sexual prowess and excessive drinking among certain men.

Mfecane (2007) draws on the constructions of masculinity and develops this further by focusing on the various markers of masculinity and implications thereof particularly the consumption of alcohol as an assertion of manhood among certain men which leaves them vulnerable and prone to HIV related illnesses. The implication of alcohol at the SAAO often results in sexual harassment and other sexual improper conduct, which are perpetrated by men.

The SAAO as a male dominated space is characterized by a strong drinking culture. As previously indicated, men avoid social interaction during work-hours, and they may not come out as often during lunch-hours to eat. When they do meet up for lunch outside the office, it is always a time for them to socially engage over a beer at a pub. The SAAO's preferred restaurants are “The Wild Fig” and “The River Club”, both of which are within walking distance.



At the riverside club where the astronomers usually meet for lunch, and drinks. Discussions around sports, current affairs, published papers and upcoming astronomy related events are also discussed here.

Both these establishments serve alcohol, and are venues where the astronomers can enjoy their meals over drinks including beer, wine and spirits. Consequently, consuming alcohol, often in large quantities, is often integral to networking and a range of important work-related activities that are often not extensively discussed in formal settings. These topics can range from the latest news, developments into the field, research publications,

individual/departmental work projects, and information about funding opportunities for advancing research. Crucial social sites for work-related networking and exchange activities are therefore strongly tied to performances of masculinity.



It is noteworthy that this strongly masculinized way of interacting socially feeds into formal work. During some functions, whether it's a paper that is presented or a small seminar talk, which requires everyone to come out whether during the day or evening, alcoholic beverages of various kinds, excluding strong spirits are usually served after the talk or seminar. I have also been in attendance at some of these late afternoon-evening talks where wine and beer are part of the astronomers' culture, and often felt an acute sense of how a world of triumphant manhood gets entrenched and makes anyone who cannot fully relate to this culture feel like an intruder.

One participant remarked that:

*"It's a masculine kind of culture but not like in an obvious kind of way. Just in the fact that the people that are in charge, the people that have the power, and the money and the titles and everything are men so that filters down. Like get together and socials are sort of very Eurocentric. It's more like, "we going out for a drink, let's go to the pub for a drink. That sounds like a thing men do, not to say that women can't do it, but it's not like, let's go out and have a chat in a relaxed place. It's like, 'let's go to a place that serves alcohol where we*

*can drink alcohol'. That excludes a lot of people because its stuff that men like to do. That's the whole culture of socialising. And um...it's very difficult" (Participant #2)*

Drinking is often associated with or connected to performances of masculinity that stress men's sexual prowess and remind women of their status primarily as sex objects. The following participant explained this as follows:

*"In general, I feel that it's a male set culture, like the males determine the culture, like the 2 emeritus professors we have, they are still around and you know like who sets the tone for how things are done are people that have been here the longest. I feel like, I mean I don't know how the men interact with one another but sometimes I do. I mean I don't know specifically but I know it can be sexist at times and they will say things that are sexist and think that we are not listening. There's been cases of sexual harassment or maybe not sexual harassment but sexual impropriety maybe, things that don't get taken seriously sometimes...Ummm, I feel, I don't feel I personally don't interact differently with men than I do with women. That's because I am conscious of how I present myself and I don't believe in things like inequality politics. I find that very distasteful and sometimes I myself try to present myself the same with men and women or students or professors and people of different backgrounds, and races and culture or religion" (Participant #1)*

As the participant observes, sexual harassment is often demonstrated in covert ways, revealing the complexity of sexual harassment in taking a variety of forms through verbal utterances, conduct, jokes and so on.

The evidence presented under this section has therefore focused on the centrality of masculine performance in the behavior of male employees, a performance which comes to define the tone and define the standards for the SAAO as a whole. This environment exposes the way in which insider status is often silently established and often not spoken about.

Sexual harassment is defined as a pervasive form of discrimination against women. According to the Stockdale (1996) some of the most recognized forms of sexual harassment include but are not limited to; direct sexual advances or propositions,

including higher-ranked employees asking for sexual favours, intimidating or excluding women employees to jeopardize their employment status. It also involves creating a hostile workplace for women by using sexist jokes.

The work on masculine culture by (McLaughling, 2012) seems to capture harassment in institutions. McLaughlin unpacks the complexity of sexual harassment in the workplace and further underpins it to other dynamics of authority and power, arguing that core feminist theories should first try to understand the concept of power and workplace authority. McLaughlin, argues that sexual harassment is at times “motivated by control and domination that by sexual desire”. Linking this with the dynamics at the SAAO, where women are also subjected to forms of sexual harassment in subtle and obvious ways, and also in a space where both power and authority have always been unevenly distributed, there are evident congruencies between McLaughling’s arguments on sexual harassment and how it actually manifests itself at the SAAO.

Assumptions about gendered bodies, which bodies have authority and entitlement, and how certain bodies register disrespect of others seem to be manifested in the use of bathroom and toilet spaces at the SAAO. It has been noted that women are often subjected to harassment, and that the everyday life at the SAAO often countenances sexist and misogynistic jokes about women’s bodies. At the same time, women’s bodies are often extremely vulnerable in relation to the arrangements made about cleanliness, toilets and bathroom spaces.

In her article about gender and toilets, Claudio (2012) details battles that come with sharing toilets spaces and traces these to inclusion, equality and power struggles that

take subtle forms in institutional cultures. Issues that can emanate from dynamics of sharing, who leaves the toilet seat up, who messes up the most, to who is then expected to clean up after the mess in these shared spaces. Needless to say, it is always the woman that is subjected to the cleaning up after the men, as it is often the women that are employed as cleaners, especially when it comes to cleaning and scrubbing toilets. Even when women are As a means to installing a sense of order and responsibility, women often leave notes on the toilet doors of shared bathrooms for all to clean up after themselves and not to splatter urine all over but often times most men are not so receptive to these as they know someone is bound to 'fix' things and restore hygienic order in the place.

The image below is of a woman staff member just entering a toilet.



The physical image of toilet spaces bear clear markers of how gendered the space is. The toilet shown here does not even have hand towels inside them. The air-freshener canister also stands out as something that is not really a necessity, thereby silently echoing that 'boys can do without it'.

The literature speaks of how certain colour codes work to distinguish between 'boy' and 'girls'. How one is gendered as both male and female often comes from early socially constructed codes and meanings that are used to classify or distinguish and frame a child as either boy/ girl or male/ female. The idea behind same sex or unisex toilets is to have an inclusive gender-neutral toilet where both male and female use freely without and feeling of difference or prioritized needs of others whether explicitly or implied. However, that is not the case here. People of any sex or gender should be able to use this toilet without experiencing any feelings of discrimination on their gender identity.

Toilets at the SAAO are not non-gender sensitive and neutral (even though they are expected to be used by all), but are ultimately marked as masculine. The toilets at the SAAO are evidently gendered male with a subtle 'inclusive' or 'openness' to females. Moreover they overtly exclude disabled persons at a time when most South Africa institutions have ensured that certain basic facilities cater for differently abled bodies.

### **Regulating Entitled Bodies at the SAAO**

Gendered binaries intersect with others (usually race, class and nationality) in further deepening the hierarchical relationships at the SAAO. It is ironic that despite the SAAO's outreach projects and efforts at community interaction seek to convey the value and relevance to all ordinary people. The space remains, however, profoundly elitist and exclusionary.



The image above is an illustration of the main entrance of the SAAO. As the image shows us, this consists of boom gates only, which imply that entrance is restricted to vehicle owners and immediately signals the nature of accessibility at the SAAO. Though the SAAO has many employees who are pedestrians, the symbolism that underlies these big boom gates that cater for cars is subtle expectation that the SAAO is meant for the elite.

This offers insights into how certain classed and raced women are expected to perform certain roles, despite the fact that the overall masculinist culture reinforces very traditional ideas about women's bodies as weak and subordinate in relation to men's bodies as strong and authoritative.

Moreover, the operating of gates, managing of the register, and access control and managing of the comings and goings of staff at the observatory is part of administration, and as the first set of data and the literature presented in chapter two speaks to the tasks that are often allocated to women, with administration being a part of it. Here, it is a Black,



female that is stationed at the gates and is responsible for this heavy-duty task that rarely pays well.

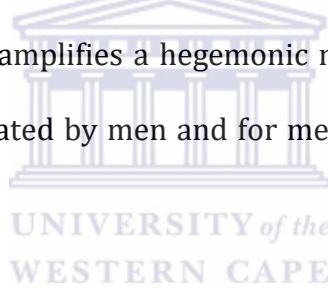


The following illustrations demonstrates how this gate is a manual gate which would require heavy power and lifting, what one would refer to in sexist terms as 'manpower' yet, the heavy lifting and manually operating of this gate is seen being done by a woman.

UNIVERSITY of the  
WESTERN CAPE



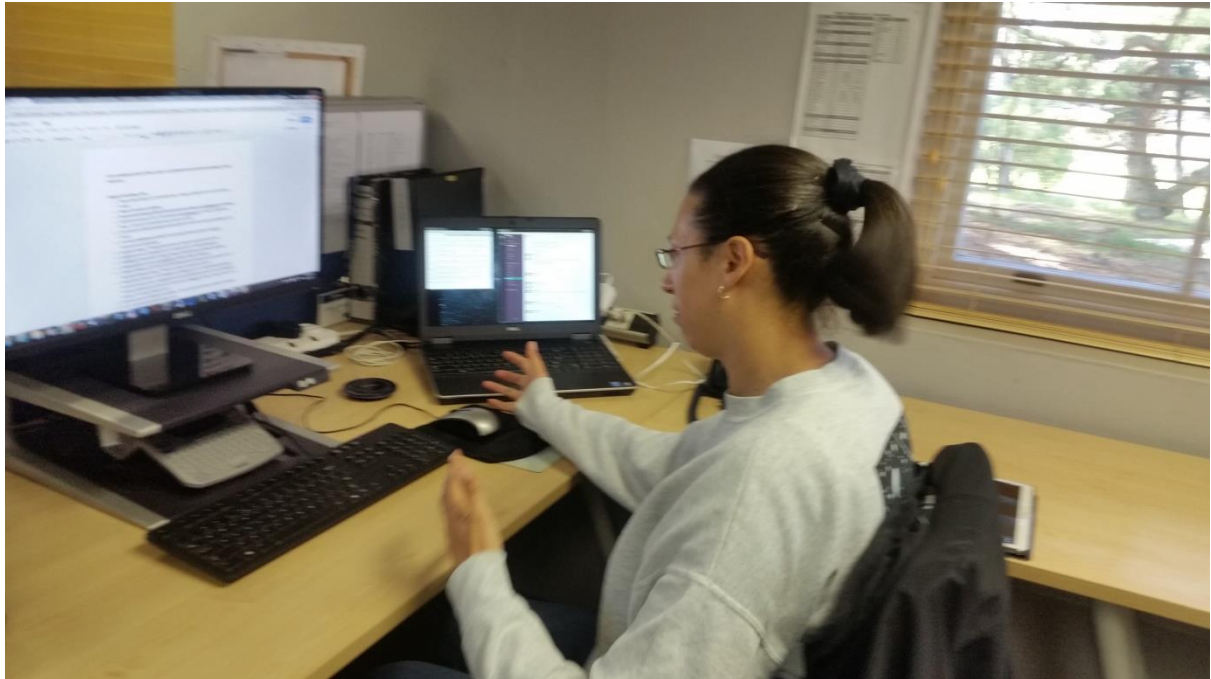
Gravesites or Tombstones are sacred symbols, which implicitly demand respect and effectively exclude non-members. The male astronomer that was buried within the institution's premises symbolizes a man who was not just a man, but a significant part of the SAAO, someone that must have contributed a wealth of knowledge and brilliant discoveries and inventions and a man who surpassed 'ordinary' but was more like family. The presence of this grave or burial site in a public space illustrates another way in which domination and power continues to exert itself and serves as a regulatory symbol between those with power and those without. The process of erecting monumental symbols is something that links back to boundaries. These are boundaries that affirm the exclusive from the marginal, influenced by race, class, gender and cultural relation. This historically determining grave amplifies a hegemonic male culture that, through space and time continues to be regulated by men and for men to continue with the legacy of White supremacy.



## **Gendered Spaces**

Constructionists have remarked that physical spaces are embedded with meanings in the same way that bodies are. Various spaces at the SAAO, including immediate work environments and more general ones connote gendered and very often also racialized and classed meanings.



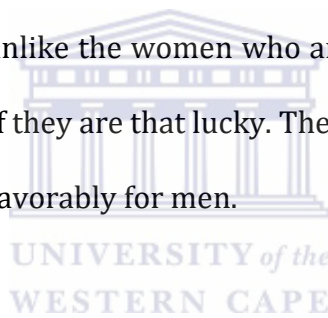


These images were taken from the Information and Technology Department at the SAAO. All three images presented here were actually taken from the same office that the male and female staff at this department share, however, the contrast between their different workspaces is striking. The images similarly to the bathroom analysis present us with struggles of power and the control of physical space. These pictures show us who is allocated vast sizes of workspace, this could have been subconsciously done. However, it does symbolize who owns the space.

Based on all the observation that I made, those women that shared offices or had an open plan set-up where space was shared, the women were compact and occupied little space compared to their male colleagues. Similarly, the allocation of space again was unevenly distributed between male and female as the much bigger offices that I observed all belonged to men. The women employees are expected to be lady-like according to sexist and societal gendered norms which basically expect women's desks to be neat and compact at all times. In contrast, the first two images taken from a male's desk/station

comprises of all kinds of cables, discs, multiple-hard-drives and other kinds of gadgets. It is significant that the tolerance for this kind of mess among would be an example of the double-standards often evident at the SAAO: women are expected to perform hard to maintain standards of work, as well as administrative skill and neatness, while men are expected only to be “good scientists”, i.e. be productive without regard to the comfort of others or sensitivity to others’ perceptions of their bodies or the spaces in which they work.

A hard-drive is understood or serves the purpose of a brain to a computer. The multitude of hard-drives under one person’s control or management possibly symbolizes that men have too much brain capacity unlike the women who are often found with one desktop and some an additional laptop if they are that lucky. The control of physical spaces at the SAAO is something that works favorably for men.



Abrahamson & Friedman (2013) offers an insightful male and academic perspective around the concept of neatness versus clutter. What the article argues is that, under the mass papers, objects and otherwise unconventional disorganized manner lies a great sense of organization and hidden benefits that can only be understood by its creator. These arguments championing messiness as evidence of superior cognitive ability clearly validate the gendered binaries that are central to gendered individuals’ behavior and entitlements or lack thereof at the SAAO.

Contrary to popular belief that clutter and mess being somewhat connected to brain capacity, the representation of men and female work-spaces as shown in these images at SAAO illustrate that; men and women have varying sets of organizational skills where

women excel at being neat, orderly, organized, neat and compact whilst men are usually surrounded by clutter and hardware. Arguments in the previous chapter drew attention to women's disparaged values. Very similar arguments can be made in relation to women's learned behaviour in being neat and tidy. More clutter is not an automatic indication of aptitude, but a result of socialized behaviour. Moreover, neatness often reflects particular ways of processing objects and ideas that may be as good as or even better than other cluttered cognitive processes. It is also significant that being neat and tidy signals more respect to those among whom one works or an assumption that someone will be available to clean up after one. Cluttered spaces, which many men believe they are entitled to, in environments that others share have a collective emotional and psychological impact.



The relegation of certain categories of classed and raced women to certain spaces is often pronounced at the SAAO. Two categories of women worth noting in this regard are cleaning staff and low-level administrators. While senior staff, especially men, have entitled access to all spaces, certain groups have extremely limited access only to spaces associated with their servicing roles.

The low-level earners that make up of the cleaners, security personnel, and gate marshals and gardeners share similar spaces as their jobs require them to be on the field doing hand related work. The kitchen staff and cleaners have a double insider-outsider position as their duties furnish them with the status of insider, though they are outsiders in actuality. The administrative staff, similarly to the double status of afforded to the cleaners and kitchen staff, they too are located inside the building and this job carries extra perks such as office space, table and a chair and the freedom of interacting and being

counted in the milieu of scientific corporate culture. Again, the reality which is based on their shared experience and observations signify the women's painful experiences of being excluded, feelings of not fitting in, the attitudes of the scientists serve as a constant reminder of how it truly feels to not belong, and to not fit into a culture that one supposedly represents and is a face and point of contact for.

This interplay demonstrates complex, hybrid hierarchical classifications based on class, ethnic, racial and cultural membership. What this essentially translated to is that the class of the dominant class presides over everything and everyone else, and only those that come from higher social backgrounds can actually attain class resources and not the low-level admin staff and other minority groups that come from inferior backgrounds.



What I observed here was that, this was one space that is assigned to women, specifically the cleaning staff. Though coffee is usually served in an open space somewhere between the library, and outside, this is where the staff first makes it before it is wheeled out to the astronomers before the cleaners will go back to their 'spots'.

What is of particular interest here is how even though these women were not busy or had any other remaining chores tying them to the kitchen and instead were just conversing

when I found them there were still confined to these domestic four-walls. It is as if they have been conditioned to exist only there, and have no sense of being able to relax in or temporarily visit the vast and comfortable context in which the SAAO is situated. Whether this space was formally designated to their use is not my argument here. However, what is important is how space is marked in the form of symbolic power, so that particular individuals come to internalize their rights to certain spaces, or their natural “belonging” in certain spaces.

This chapter has unpacked the deepest complexities that we often take for granted in institutional cultures. An example of this would be the power that is often unidentifiable which manifests itself in through symbols of hidden meaning. The analytical process of this chapter has been beneficial in exposing the regulator(y) culture or element behind institutional cultures (Bailey, 2014). The regulatory culture is the examination of an institution’s culture through artefacts, beliefs and values and basic underlying assumptions. Artefacts are generally observable while meanings around beliefs and attitudes and assumptions can be hard to decipher.

This chapter has attempted to bring to the surface some of the unconscious ways of seeing the world. Gerhardi (1995) also pays significant attention to the symbolic order of gender in institutions and details precisely how gender relations are discursively and culturally produced and reproduced. However, this qualitative feminist study has made it possible to observe the often deeply naturalized and embedded ways in which gender is inscribed in institutions mainly by using various methodologies, on-site observation, interviews, photography and image analysis.



## CHAPTER SIX: Conclusion

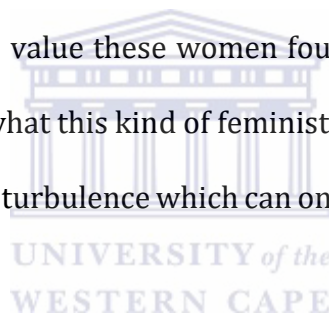
Though there have been many anecdotal accounts by and about women in science, my research has not found any South African feminist studies dealing specifically with gendered dynamics and institutional cultures within science. I therefore believe that this study offers a unique perspective by applying a gender lens to astrophysics, as particularly prestigious area in South African science.

The thesis has amplified how the scientific fields seem to revolve around what is factual, empirically verifiable and objective, and has demonstrated that the SAAO in fact has a very value-laden culture. Moreover, this culture is constantly being reproduced by naturalized work arrangements, ideological beliefs, structures, spaces and objects. .

One of the aims of this research was to explore how certain women experience an oppressive work environment. The women in this study expressed their perceptions of what fairness is and what it is not. The analysis also exposed women's dissatisfaction and unhappiness in relation to unrealistic expectations about their time. Some of the perceptions conveyed were that the field was extremely exclusionary, hierarchical, unwelcoming, unfriendly, discriminatory, gender-insensitive, characterized with bouts of sexual harassment and condescending and belittling remarks from male counterparts. All these create psychological complexes that leave them feeling like imposters in their own field. The data presented in this study therefore seems to correlate with the literature that has investigated and written about the gendered nature of institutional cultures (Barnes, 2007; Diaw, 2007; Gherardi, 1995; Hames, 2007; Lewis, 2015; Mgcotyelwa,

2013; Vincent, 2013) and similar studies that have offered insights and feminist critiques into science (Keller, 1992-1983; Haraway, 1988; Harding, 1986, 2002; Vaughn, 2007).

The study has also demonstrated how discriminatory practices and structural impediments are the master architects that work as tools of erasure for women as well as other subordinated groups. The research field was therefore shown to be characterized by intersecting power relations. The data further noted some crucial observations around women's silences. Though the women research participants were eventually very forthcoming with information, there was also evidence of in-between the silences, sighs and brief responses. Moreover, the non-verbal cues that were observed conveyed meanings around the value these women found in this study. There was also evidence of excitement, about what this kind of feminist study would yield in the end. All this suggests a mound of hostile turbulence which can only be picked up by future studies.



The data gathered showed that there exists a plurality of gendered dynamics within the SAAO, which operate from different vantage points but ultimately impact on all women in negative ways. Based on my observations and the discussions that I had with my study participants, the men in this space do not fully understand how gendered discrimination works, and how it is often normalized. Moreover, the limited intellectual or political attention paid to issues that seem to have nothing to do with science (for example, issues of race, gender and class are seen to be relevant to other disciplines) means that whatever men have been socialized to accept is never contested in their work environments. It is extremely ironic that these work environments are meant to produce knowledge that is relevant to the broader society.

This study debunks the notion of 'objectivity', which makes truth claims in this field. I argue that this is but an illusion, that truth is relative and can be shaped by many factors and ranging multiple standpoints. Therefore, 'truth' is not just a scientific entity but a scientific fallacy whose power of existence is championed by those that stand to benefit the most from it. What is true and objective in one context can relatively transform and become a fallacy in another discipline, and will additionally be influenced by conventions and methods used to support and strengthen its value claims. Therefore, the claims to knowledge that this field tends to make should also be equally receptive to other perspectives, disciplines and models of inquiry. I can only hope that further studies will further reveal and analyze whatever this study might have left hanging.

### **Limitations of Study**

Though the initial sample of the study aimed at having three women for in-depth interviewing, more women in this field across the SAAO/UCT/UWC seemed eager to participate. However clashing dates and schedules meant that I could only accommodate one more person and unfortunately had to forfeit other insights. There were times of disappointments too, where I also experienced being let down by last minute participant declines. This is something I needed to make sense of, as I was left with various questions about why certain participants withdrew or could not make appointments at certain times.

The September 2015 to 2016 #FMF Protests also affected the final product of this study as a wealth of time that I had planned to invest for my writing was lost during these protests that severely affected students that live on campus like myself. The quality of

my study could also have been compromised during this time as I was displaced a number of times and had to seek refuge from friends. Ideally, a project of this sort requires more intensive time spent with participants and retrospective visits to the research site. Events at universities between 2015 and 2016 made this impossible for me. At the same time, it is important to note that these events are in many ways symptoms of the problems this research has uncovered at the SAAO. While this institution has not been directly affected by student protests, it is part of the broader landscape of South African Higher Education and deserves more scrutiny.

## **Recommendations**

The SAAO's very foundations have for a long time been premised itself on Western ideologies. It affirms and celebrates foreign symbols, history and a culture that exudes colonial might. It is therefore an "African" institution with no real connection to its immediate geographical, cultural or political contexts. Instead, it is an institution with a borrowed past.

It would be ideal if the SAAO and the various bodies and government departments to which it needs to account worked towards revising its obviously colonial legacy. South African institutes of learning need to free themselves from these colonial symbols that mostly serve elite foreign white males who are often seen to have superior expertise in South African science institutions.

The SAAO needs to work towards defining a worldview, reflective of local knowledges and histories. These should include the legacy of knowledge about the universe and the environment among indigenous people of South Africa.

The SAAO would also need to think around ways of making its organisational culture more inclusive and diversified. One way of achieving this would be to prioritize human capital investment. The starting point here would be an immediate talent search or recruitment process for a diversity management head or division alongside a gender mainstreaming specialist to facilitate this process and educate everyone involved around the process. Coaching and mentoring would be effective especially if the executive management bought into the process. It is very imperative that management at the SAAO are able to articulate the intellectual value of diversity management and mainstreaming gender in programmatic areas.



Another recommendation that would benefit this field is if the South African Astronomy body could embark on a comparative, cross-national study whereby it would partner or link with other similar structures where it could draw insights from, compare with and exchange ideas and strategies that would make the field of the science much more inviting and shift its heavily masculinist nature.

The American Astronomical Society is one such body as it is constantly evolving and looking into developments to transform an area that has traditionally been infamous for its lack of transformation. This society has focused especially on making the field more woman-friendly, and encouraging quantitative and qualitative studies of women and gender in American astronomy.

It is also of pivotal importance for the South African Astronomical Observatory to embark on an intersectional study. The data revealed many crosscutting and intersecting power relations. These indicate that many of the rights and freedoms that South African employees should enjoy are effectively undermined by pre-democratic South African power dynamics.

An intersectional study would address most of the grievances that the women have mapped out in the analysis, chapter 4. These would also address the question of why there are such few women who move into the field in the first place, and why women students rarely pursue advanced study in the field.



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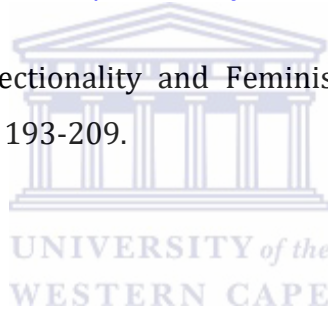
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# APPENDICES



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## FACULTY OF ARTS

### INFORMATION SHEET

My name is Thembelihle Bongwana. I am a 30 year old female student from the University of the Western Cape doing my Masters Research in Gender and Women's Studies. I will be doing a study titled ***Gendered Dynamics in South African Astrophysics: A Case Study of the South African Astronomical Observatory***. Your involvement is therefore very crucial for the fulfillment of my degree requirements, and for seeing this study through. My study will be focusing on women in the field of astronomy and/or astrophysics, focusing primarily at the South African Astronomical Observatory (SAAO) as study site, Western Cape. The study will look into interviewing 3 women between May to June 2016.

Women still remain marginalized when it comes to key decisions and high positions within academia, politics, in the economy etc. and patriarchy within institutional structures. This trend seems persistent even though we have a number of endorsed policies that are geared at promoting women, and major organisations that have tried mainstreaming gender within their work programmes. A study on institutional culture will lead to deeper understanding of the nuances of gendered power relations, particularly those that are oppressive in nature.

As someone with a Social Science background, I am interested in understanding how inequalities manifest, are perpetuated or dealt with within this particular discourse by studying the astronomical institutional culture, women and the positions they occupy.

For further details or queries relating to the study please contact person(s) below;

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WESTERN CAPE

## *Gendered Dynamics in South African Astrophysics: A Case Study of the South African Astronomical Observatory*

**Researcher:** Thembelihle Bongwana

**Please initial box**

1. I .....confirm that I have read and \_\_\_\_\_   
 understand the information sheet explaining the  
 Above research project and I have had the opportunity to ask questions about the project.
2. I understand that my participation is voluntary and that I am free to withdraw at any time  
 without giving any reason and without there being any negative consequences. In addition,  
 should I not wish to answer any particular question or questions, I am free to decline.  
 (If I wish to withdraw I may contact the lead researcher at any time)
3. I understand my responses and personal data will be kept strictly confidential. I give  
 permission for members of the research team to have access to my anonymous responses.  
 I understand that my name will not be linked with the research materials, and I will not be  
 identified or identifiable in the reports or publications that result for the research.
4. I agree for the data collected from me to be used in future research.
5. I agree for to take part in the above research project.



\_\_\_\_\_  
 Name of Participant Date Signature  
*(or legal representative)*

\_\_\_\_\_  
 Name of person taking consent Date Signature  
*(If different from lead researcher)*

\_\_\_\_\_  
 Lead Researcher Date Signature  
*(To be signed and dated in presence of the participant)*

*Copies: All participants will receive a copy of the signed and dated version of the consent form and information sheet for themselves. A copy of this will be filed and kept in a secure location for research purposes only.*

**Researcher:**

**Supervisor:**

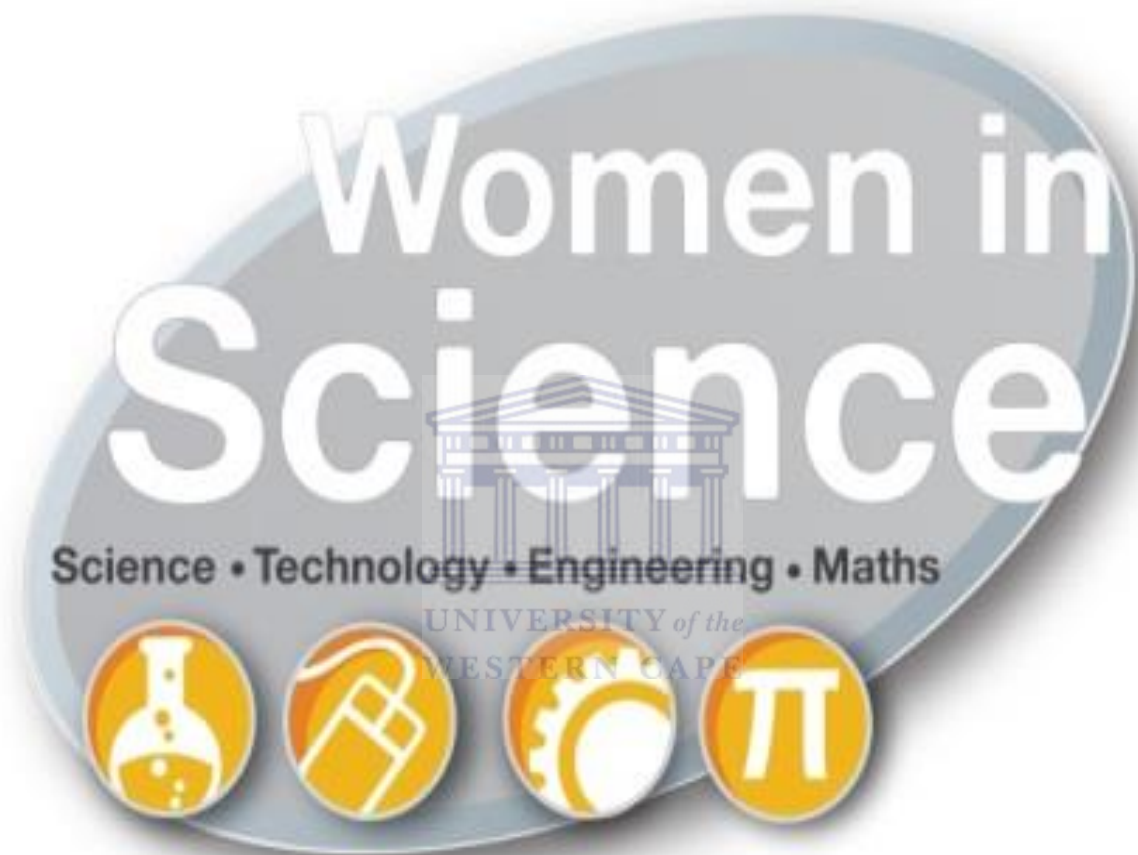
**HOD:**

*SAAO*

*PARTICIPANT*

*INTERVIEW*

*QUESTIONS*



# *Gendered Dynamics in South African Astrophysics: A Case Study of the South African Astronomical Observatory (SAAO)*

## **INTRODUCTION**

### **PERSONAL DETAILS & RESPONSIBILITIES**

- What is your name, age, and where do you live?
- What is your position at the SAAO?

### **INSTITUTIONAL CULTURE & HIERARCHIES**

- What is particularly important to you in your organisational culture?
- Do you see any differences between values and standards for men and women?
- Is there something like a specific masculine or specific feminine culture?
- Do you see any hierarchies that exist, and if so what hierarchy levels are there?
- Are men and women represented on the same levels? Full time, volunteers, executive etc.

### **INSTITUTIONAL ANALYSIS**

- In your opinion and within this organisation, would you say there different organisational relations between men and women?
- Are there set working hours and are they applicable to everyone?
- If not, who gets affected by them more? Men or women? And are they at the same or different levels?
- Who designs the institution's work plans and programme activities and would you say these plans are inclusive and takes both men and women equally into account? Please explain your answer?

### **GENDERED DYNAMICS: LEISURE AND SOCIAL EVENTS**

- How would you describe social interactions in this field?
- What are the social relations like during lunch times?
- Do men and women interact together or are there gendered divisions even during lunch?
- What is normally spoken about in tables during lunch?

### **STAFF EXPERIENCES**

- What experiences can you share about male and female staff representation in this space?
- What differences between men and women have you analysed? You may draw on staff relations or general perspectives.

## Ethics Statement

While carrying out this research I will observe the highest possible ethical standards. The University of the Western Cape's code of Ethics guidelines from the Humanities and Social Science Research Committee will be used and attached to the appendices section. The Ethics Guidelines are there to inform participants of their rights, and to guide the researcher's method of the correct and ethical way of doing research. For all participants to be interviewed, I will ensure that each person has a copy that they have read and understood before allowing them to sign their consent forms and that they all understand what they are consenting to. Participants will receive an *information sheet* with a *consent form*. It is imperative that participants are informed of their rights from the onset and the intent of the study they are involved in, and the protection of their identities. Thus, I will strive to maintain anonymity by protecting and concealing their identities, and instead issue pseudonyms for subjects. All recorded audio tapes of interviews shall be destroyed after submission of thesis with all transcripts stored and secured in a place of safety.

Researcher: T. Bongwana

