



# “A Woman ‘in the snow among the Clocks and instruments’”: How Adrienne Rich Reimagined the Lives of Women Astronomers

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## Introduction

- Research on the representation of women in Science, Technology, Engineering, and Mathematics (STEM), including astronomy, consistently shows that women participating in these fields
  - hold lower status positions and salaries [1]
  - receive fewer publications and citations [2]
  - are tasked with the tedious work [3]
- Our work approaches women’s experiences in astronomy from the lens of Adrienne Rich and her 1968 poem, “Planetarium,” which uses metaphors to understand women’s experiences through their technical work in astronomy.
- We hope to construct a new narrative that helps researchers to better understand women’s roles in these fields and to lay a groundwork for expanding those roles, while better recognizing their importance, in future astronomical research projects.

## Methods

- Our work explores the ways in which Rich’s metaphors in “Planetarium” can structure and connect the experiences of female astronomers who overcame common obstacles despite differing historical periods.
- These metaphors are [4]
  - “locating a signal in the noise”
  - “penance for impetuosity”
  - “Women in the snow among the Clocks and instruments”
  - “Let me not seem to have lived in vain”
- Our analysis expands upon the experiences of five female astronomers:
  - Jocelyn Bell Burnell (1943-present), who discovered the first radio pulsar
  - Cecilia Payne-Gaposchkin (1900-1979), who proposed that stars were predominantly hydrogen and helium
  - Vera Rubin (1928-2016), who was among the first to propose the existence of dark matter
  - Jill Tarter (1944-present), the first director and co-founder of the Search for Extraterrestrial Intelligence (SETI) Institute
  - Caroline Herschel (1750-1848), the focal point in “Planetarium,” who discovered eight comets and aided her brother in his discovery of Uranus.

## Conclusion

- Rich’s poem connects the experiences of these women through their similar struggles in
  - overcoming ubiquitous discrimination
  - attempts at professional advancement
  - vocational success despite undervalued skills
  - overdue historical recognition
- Our analysis can be used to provide additional insight into the unique challenges currently facing women of color in science.
- We hope this analysis contributes a new perspective in science communication to help mitigate the dissemination of gender exclusivity in research, education, and leadership settings.

### “Planetarium” by Adrienne Rich

Thinking of Caroline Herschel (1750–1848)  
astronomer, sister of William, and others.

A woman in the shape of a monster  
a monster in the shape of a woman  
the skies are full of them

a woman ‘in the snow  
among the Clocks and instruments  
or measuring the ground with poles’

in her 98 years to discover 8 comets  
she whom the moon ruled like us  
levitating into the night sky  
riding the polished lenses  
Galaxies of women, there

doing penance for impetuosity

ribs chilled  
in those spaces of the mind  
An eye,

‘virile, precise and absolutely certain’  
from the mad webs of Uranusborg  
encountering the NOVA  
every impulse of light exploding from the core  
as life flies out of us

Tycho whispering at last

‘Let me not seem to have lived in vain’

What we see, we see  
and seeing is changing  
the light that shrivels a mountain  
and leaves a man alive

Heartbeat of the pulsar

heart sweating through my body  
The radio impulse  
pouring in from Taurus  
I am bombarded yet I stand  
I have been standing all my life in the

direct path of a battery of signals

the most accurately transmitted most  
untranslatable language in the universe  
I am a galactic cloud so deep so involuted  
that a light wave could take 15

years to travel through me and has taken

I am an instrument in the shape

of a woman trying to translate pulsations

into images for the relief of the body  
and the reconstruction of the mind. [4]



Caroline Herschel



Jill Tarter



Adrienne Rich

### Examples of signals in astronomy that relate to women’s experiences:

- Interplanetary scintillation and classroom cat calls toward women [5, 6]
- Stellar spectroscopy and excessive expectations for women [5]
- Optical spectroscopy and overcoming obstacles [7, 8]

### Examples of doing penance for impetuosity

- Domestic arrangements and part-time work [9]
- Restricted positions without advancement [5]
- Inequitable pay [5]
- Exclusion from Honor Societies [10]
- Lack of bathroom facilities at telescopes [7]
- Affected communication and exaggerated modesty [10, 11]

### Examples of “women in the snow among the Clocks and instruments”

- Bell Burnell producing daily sky charts for Hewish [6]
- Herschel making mirror molds from horse dung [11]
- Rubin omitted as author from De Vaucouleurs’s publications of her work [7]
- Payne-Gaposchkin’s work under Shapley measured in “girl hours” [5]
- Tarter’s mastery of the PDP 8/s computer at U.C. Berkley [10]

### Examples of “let me not seem to have lived in vain”

- Bell Burnell’s discovery of the pulsar and omission from Nobel Prize [6]
- Rubin’s failure to receive a Nobel Prize [7]
- Payne-Gaposchkin’s concluding her accurate results as “spurious” [5]
- Herschel’s reliance on male advocacy for recognition of work [11]
- Remarks to Tarter that she could hold a position in “chemicals for home permanents” [10]



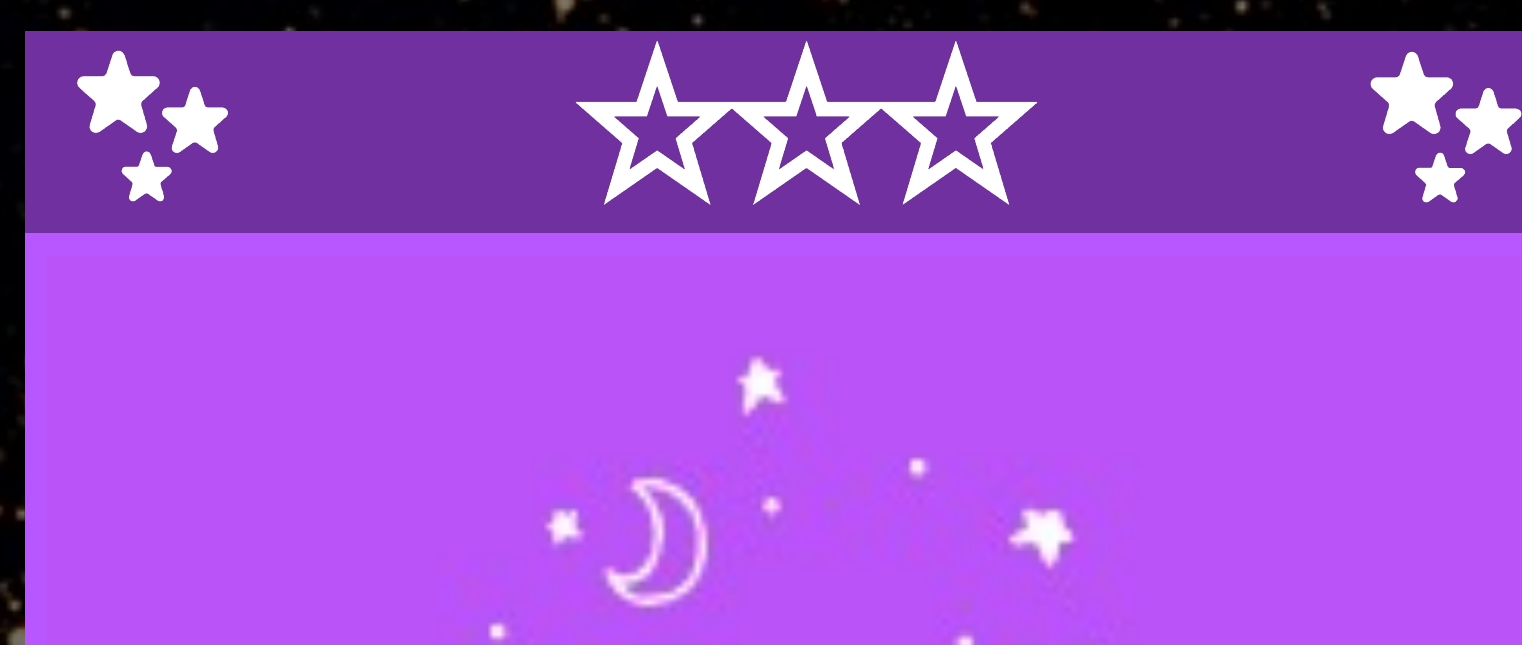
Jocelyn Bell Burnell



Cecilia Payne-Gaposchkin



Vera Rubin



"She did not consider herself a  
woman astronomer;  
she was an astronomer."

-Cecilia Payne-Gaposchkin [5]



## References

[1] D. Berné, A. Hilaire, Inequalities faced by women in access to permanent positions in astronomy in France, *Nat. Astron.* 4, 4 (2020) 296-298. [2] S. Tuttle, Astronomical community: The power of being counted, *Nat. Astron.* 1 (2017) 0154. [3] L.S. Zuñi, Women in glass: Women at the Harvard observatory during the era of astronomical glass plate photography, *J. Hist. Astron.* 52, 2 (2021) 115-146. [4] A. Rich, *The Will to Change*, second edition, W.W. Norton, New York, 1971. [5] D. Moore, What stars are made of: The life of Cecilia Payne Gaposchkin, Harvard UP, Cambridge, 2020. [6] J. B. Burnell, So few pulsars, so few females, *Sci (Amer. Assoc. Adv. Sci.)* 304, 5670 (2004) 489. [7] J. Mitton, S. Mitton, Vera Rubin: A Life, Belknap, Cambridge, 2021. [8] N. Bahcall, Vera Rubin (1928–2016), *Nat.* 542, 234 (2017). [9] S. B. McGrayne, et al., *Nobel Prize Women in Science: Their Lives, Struggles and Momentous Discoveries*, Joseph Henry, Washington, D.C., 2001. [10] S. Scoles, Making Contact: Jill Tarter and the Search for Extraterrestrial Intelligence, Pegasus, 2017. [11] E. Winterburn, *The Quiet Revolution of Caroline Herschel*, History Press, Cheltenham, 2017.