

 northumberland players present

SILENT SKY

By Lauren Gunderson

Firehall Theatre, Cobourg

March 22, 23, 29, 30 April 4, 5, 6, 2019

8:00pm

March 24, 31 April 6, 7, 2019

2:00pm

Silent Sky is presented in special arrangement with Dramatists Play Service

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Director's Notes

When I read *Silent Sky* over a year ago now, I was fascinated by the story of these three remarkable women who once worked at Harvard and documented the stars. I was inspired by its timeless themes and strong female characters, and immediately wanted to present it in the Firehall Theatre space. I had never heard of Henrietta Leavitt before this play, but have since learned that even among the most amateur astronomy buffs, she is revered and remembered for her findings. Henrietta and her colleagues Annie Cannon and Williamina Fleming were trail-blazers in their time, the forerunners of our present day female NASA Scientists. These "computers" as the women were called, broke the rules, pushed to study more, questioned the norms and accepted beliefs, and rose above their societal challenges. Their findings are the basis of a lot of our modern knowledge of the universe, its size and how we measure it.

In the early 20th century, men with authority were credited for the work these women did. Science journals documenting their work gave the women a second billing on the findings. Years after their deaths, we read and study them, and it is with great pride that women today remember these remarkable ladies as the first in their field.

It has been a privilege to work with this remarkable cast and crew. Together I feel we have given justice to the story of Henrietta Leavitt and her colleagues. It has been fun to recreate the offices at Harvard, and the equipment used by the "computers" for mapping the sky. My thanks to Victor, Amy and David for the sound and lights that so perfectly complete this story, and to my family Tim, Lauren, and Claire who support these projects in so many ways.

Valerie Russell

*"When I heard the learn'd astronomer,
When the proofs, the figures, were ranged in columns before me,
When I was shown the charts and the diagrams, to add, divide,
and measure them,
When I sitting heard the astronomer where he lectured with much
applause in the lecture room,
How soon, unaccountable, I became tired and sick,
Till rising and gliding out I wander'd off by myself,
In the mystical moist night-air, and from time to time,
Look'd up in perfect silence at the stars."
Walt Whitman*

*"One of the plates you'll be working with.
A slice of heaven"*

The Cast (in order of appearance)

HENRIETTA Leavitt ... Lucy Caldwell
MARGARET Leavitt ... April Corning
PETER Shaw ... Ian Everdell
ANNIE Cannon ... Rebecca Rennicks
WILLIAMINA Fleming ... Carol Beauchamp

Setting

Star Field outside a church, Wisconsin
The Harvard Observatory 2nd-floor offices
Leavitt home, Wisconsin
Ocean liner on the Atlantic
Henrietta's home, Cambridge, MA

Time

1900-1920

**Original music composed for Silent Sky
by Jenny Giering**

**The play runs 2 hours with a fifteen minute
intermission**

Acknowledgements

Thank you for your contribution to this production:

Patrick Cruikshank, Laura Garton, Lynn Hilborn, Jennie Ryan, Mary
Schultz, Black Cat Cobourg, Richards Printing, David Glover, Lyss
England and Marc Cowin of 89.7 FM

Front of House: Leslee Argue, Francine Bélanger, Jack Boyagian,
Linda Cardie, Carol-Anne Caswell, Dave and Mary Liz Clark, Pat
Crimmins, Laura Garton, Margaret Hilborn, Margaret Kropf, Craig
Martin, Doreen Page, Micheline Prendergast, Carlotta Rutledge,
Dawn Waters

"The sky's the limit"



Henrietta Swan Leavitt

Henrietta was born in Massachusetts to George Roswell Leavitt and Henrietta Swan Kendrick. She attended Radcliffe College, the all-women companion college to Harvard University, where she earned a Bachelor's degree in 1882. She made progress towards a graduate degree in Astronomy before going to work as a computer in the Harvard Observatory under Dr. Charles Pickering.

During the course of her work under Pickering, Henrietta studied variable stars, which are stars that show different levels of brightness at different times. From there she went on to develop Leavitt's Law, which states that there is a straight line relation between a Cepheid variable star's intrinsic luminosity (true brightness) and the log of its period. Although she went uncredited for several decades and was unable to contribute to follow-up research, her discoveries went on to influence the work of Edwin Hubble.

Hubble, for which the Hubble Space Telescope was named, made the earth shattering discovery that there were other galaxies, outside our own Milky Way galaxy, this only as a result of Leavitt's work in helping to determine stellar distance. Up to that point, we thought the universe was only as large as our own galaxy, and that these other blobs of light (in reality other galaxies)... were simply glowing gas nebulae within the Milky Way galaxy. In reality, they turned out to be other galaxies, the closest being the Andromeda galaxy some 2.5 million light years away!

Without Leavitt's work, Hubble would not have come to this conclusion...that there are galaxy worlds beyond our own galaxy. It was revolutionary! It was a moment in time when our concept of our universe expanded a trillion fold in the blink of an eye.

Henrietta Leavitt succumbed to cancer in 1921 at the age of 53 and was buried in the Leavitt family plot in Cambridge, Massachusetts. Her gravestone lacks any mention of her contribution to the field of Astronomy.

"We are mapping the sky"



Annie Jump Cannon

Annie Jump Cannon was born in 1863, and was first taught about constellations as a child by her mother who later encouraged her to pursue scientific studies. Cannon studied mathematics, physics and astronomy at Wellesley College and then pursued a graduate degree in Astronomy at Radcliffe College, where she enrolled as a "special student" in order to gain access to the Harvard Observatory telescope.

She received her degree in 1907. In 1896, as part of her studies, Annie was hired by Dr. Charles Pickering, then the Director of the Harvard Observatory. While working for Pickering, Cannon published several articles on Stellar Spectra in numerous journals, worked on the Henry Draper Catalogue, received the Draper Gold Medal, and was the recipient of numerous grants.

Cannon developed the system of spectral classification which organized stars by colour. Later into her work, the O B A F G K M categories were discovered. They did not just relate to colour, but also temperature and size, as these three characteristics of a star are intrinsically connected. To this day, the classification system she developed is one of the foundational concepts in astronomy education, and "Oh Be A Fine Girl, Kiss Me" is still used to remember star classification categories.

After publishing her first paper in 1901, Cannon was made Head of Photometry, the department responsible for analyzing star plates at Harvard. She still holds the record for most stars classified in a lifetime at over 500,000.

Every year the American Astronomers' Society hands out the Annie Jump Cannon Award to that year's most prominent female astronomer. Annie Cannon retired in 1940 but, continued her work until a few weeks prior to her death in 1944.

"There is a lot. Going on. In the world."



Williamina Fleming

Williamina Fleming was born May 15, 1857 in Dundee, Scotland. She emigrated to America alongside her husband and her young child at the age of 21.

She was shortly thereafter abandoned by her husband, and forced to figure out how to make a living for herself and her child in America. As a result, she found a housekeeping job in the home of Dr. Charles Pickering, Director of the Harvard Observatory.

Allegedly, Dr. Pickering used to tell substandard employees that "his Scottish housekeeper could do a better job" and said it enough that eventually he gave her a job as a computer.

Over her time working for Pickering, Fleming classified 10,000 stars, discovered 59 nebulae, and published several works on her discoveries. She discovered the Horsehead Nebula, though her work went uncredited.

Despite having made massive contributions to the Draper Catalogue, Fleming's name (along with all the names of her female peers) was omitted in favour of a simple "Pickering" citation.

Fleming was placed in charge of the computing department at Harvard, after Annie Cannon's promotion to Head of Photometry. She was later made the curator of all spectral images at Harvard University.

Fleming published numerous papers on her findings, and was made an Honorary Fellow of Wellesley College in the early 1900's.

*"We can skip star to star across the deepest space
until we know ...Exactly where we are."*

"Ladies of the logbook"



Harvard Women

"We collect, report and maintain the largest stellar archive in the world."

Cepheid Stars are stars that have entered a stage of their life cycle that involves a repetitive 'pulsing' cycle of lighter and darker appearance, with the brightest Cepheid stars taking longer than the faintest.

What Henrietta discovered is the relationship between the pulsation period (the time it takes for the star to expand and contract in a single cycle) and the star's perceived luminosity. By observing the pulsation period of the star, you can use that value to calculate true luminosity and thus calculate an accurate distance to that star.

Cepheids provide benchmarks that help us determine the distance between us and various celestial bodies. If a faraway galaxy contains an observable Cepheid, the approximate distance to that galaxy can be calculated. In this way, Henrietta literally gave us the ability to map the Universe.

OBAFGKM: A system of classifying stars based on the observed colour of that star. Specifically, Annie Cannon (who invented this method) looked at a measure of what colours of light are absorbed by a star and which are reflected, from which we can infer colour and classify the different stars based on that.

"Oh Be A Fine Girl Kiss Me"

Production Volunteers

Producer & Director	...	Valerie Russell
Assistant	...	Carol-Anne Caswell
Stage Manager	...	Katie Burnham
Assistant Stage Manager	...	Terri Bicknell
Set/Prop Design & Construction	...	Tim Russell
Properties	...	Tim Russell, Lauren Russell, Ian Everdell
Costume Design	...	Claire Russell
Costume Assistant	...	Dawn Waters
Seamstresses	...	Barbara Henderson, Barbara Horscroft, Barbara Jean Taylor, Jamie Finan, Ligia Sanchez, Jane Sumners
Sound Design	...	Victor Svenningson
Assistant Sound Designer	...	Amy Burnham
Lighting & Sound Operator	...	Amy Burnham
Lighting Design	...	David Hoare
Hair & Makeup	...	Alyssa England
Assistant Hair & Makeup	...	Claire Russell, Muriel White
Marketing	...	Valerie Russell, Jack Boyagian, Ian Everdell
Show Photographer	...	Gregory Curtis
Poster & Promotional Materials	...	Lauren Page Russell
Program Design	...	Francine Bélanger

Star Spanker: A tool used to help standardize brightness measurements, and in real life actually invented by Henrietta Leavitt. Previously, brightness had been measured by observers ranking it by eye, which was too subjective for an accurate measurement. The "fly spanker"—so named because it resembled a fly swatter but was "too small to do a fly much damage"—was a piece of photographic plate with a wire handle attached which had stars of well-established brightnesses on it. This tool could be moved around in front of a glass plate with stars of unknown brightness, to help standardize the measurements and to determine if the brightness of a star had changed.

'Send more sky'

Production Volunteers



From left to right:

First row: Claire Russell, Valerie Russell

Second row: Greg Curtis, Carol-Anne Caswell, Terri Bicknell, Francine Bélanger, Barbara Horscroft

Third row: Amy Burnham, David Hoare, Victor Svenningson, Tim Russell

'Because wonder will always get us there...Those of us who insist that there is much more beyond ourselves.'

Small Magellanic Cloud: A dwarf galaxy near the Milky Way. Classified as a Dwarf Irregular Galaxy, it is about 7,000 light years across. Between 1893 and 1906, the 24-inch telescope installed in Peru and run by the Harvard College Observatory collected plates observing both the large and small Magellanic clouds. These plates were used by Henrietta Leavitt to study the Cepheid phenomenon.

"The idea that there could be galaxies as big as ours? Outside of ours? That the universe is that large? No!"

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Cast



Lucy Caldwell, Henrietta

Lucy is honoured to play the smart and passionate Henrietta Leavitt in The Players' production of Silent Sky. Lucy began performing with The Northumberland Players at the age of eight in the The King and I. More recently, Lucy has appeared on-stage in Les Miserables, The Secret Garden, Proof, Joseph, Sister Act and The Drowsy Chaperone. Lucy works as a counsellor at Cornerstone Family Violence Prevention Centre. It has been an absolute privilege to work with this exceptional cast and crew.



April Corning, Margaret

April is honoured to help tell this celestial story with her wonderful castmates. She most recently took part in a dramatic reading of "The Stars on Her Shoulders" as part of the Armistice 2018 project here in Cobourg. Other productions she has been proud to have contributed to for the Northumberland Players include the musical "Sister Act" and "Waiting for the Parade."



Ian Everdell, Peter

Ian is excited to be back for his second show with the Players as an adult (proud summer camp alumnus!), following on a great time doing Forever Plaid in 2017. It's been a long time since he did a straight-up play, and it has been quite refreshing to not spend months learning music and choreography! Previous shows include Beauty and the Beast, Little Shop, A Streetcar Named Desire, The Sound of Music, Joseph, Peter Pan, Wizard of Oz, and Oliver, and stage management with Queen's Student Opera Company and Queen's Musical Theatre.

—Cast & Stage Manager—



Rebecca Rennicks, Annie

Rebecca is excited to return to acting after her recent gigs as Stage Manager for "Last Day, Last Hour" and Assistant Stage Manager/Sound Operator for "Mary's Wedding". The Firehall is a favourite, and she is grateful to be working alongside such a seasoned and talented cast and crew. Playing the role of a real-life woman is a first! A very special thank you (and huge hug!) to Claire Russell for helping choose the audition monologue and work shopping it, too.



Carol Beauchamp, Williamina

Carol is delighted to be working with director Val Russell and the talented cast and crew of Silent Sky. Selected acting credits include: The Matron - Stars on her Shoulders, Sister Mary Martin of Tours – Sister Act, Margaret – Waiting for the Parade, Sonya - Sonya Vanya, Masha & Spike, Mrs. Ravenscroft - Ravenscroft, Chris - Calendar Girls, Maxine - Stepping Out, Shirley - Shirley Valentine, The Woman - Veronica's Room. Carol is very excited to be directing NP's last production of the season – Drowning Girls.



Katie Burnham, Stage Manager

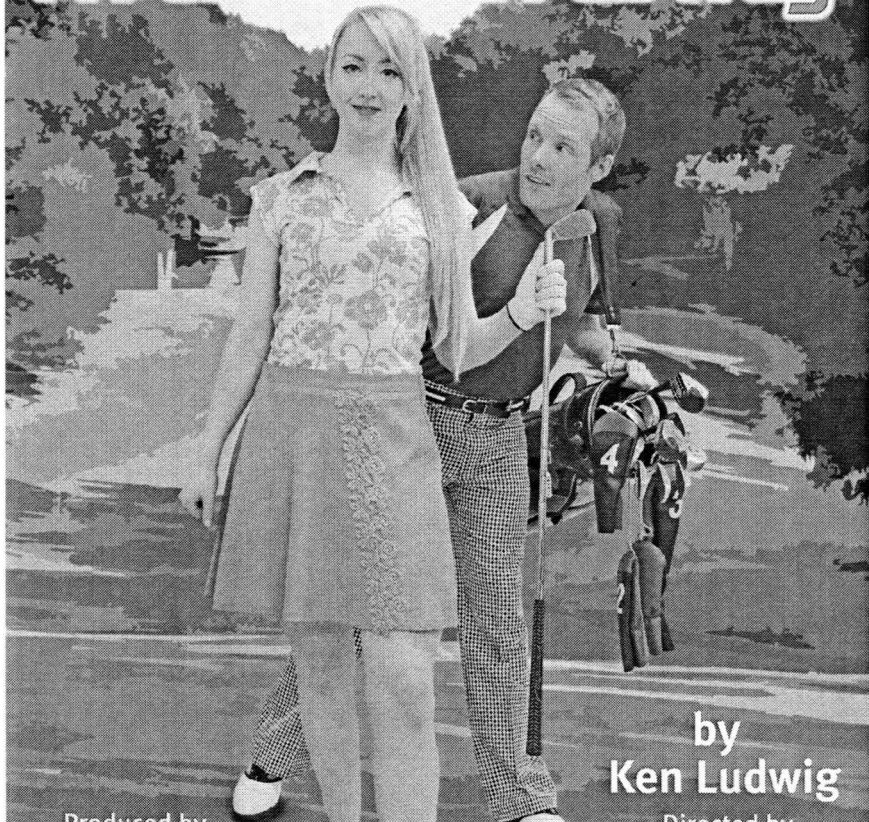
Katie is honoured to be working with such a talented cast and creative team on this production of Silent Sky. She has previously worked in behind the scenes roles in Northumberland Players productions of Les Miserables, The Secret Garden, and Forever Plaid and has most recently appeared on stage in Sister Act and The Drowsy Chaperone.



northumberland players UPCOMING SHOW

np northumberland players present

A Fox on the Fairway



by
Ken Ludwig

Produced by
Linda Cardie

DINNER THEATRE

Directed by
John Lunman

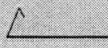
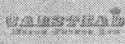
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APRIL 26, 27, MAY 3, 4, 10, 11, 2019, AT 8:00 PM

APRIL 28, MAY 5, 2019, AT 7:00 PM.


TICKETS \$56 (ALL INCL.) CALL 905-372-2105 TO RESERVE YOUR SEAT.

A Fox On The Fairway is presented by special arrangement by Samuel French, Inc.





northumberland players UPCOMING SHOW

 northumberland players present

THE DROWNING

BY BETH GRAHAM
CHARLIE TOMLINSON &
DANIELA VLASKALIC

GIRLS

Produced by Kim Brouwer & Kaye Torrie
Directed by Carol Beauchamp

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MAY 26, JUNE 2, 9, 2019, AT 2:00 PM

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The Drowning Girls is produced by special arrangement with PLAYWRIGHTS GUILD OF CANADA

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**SPRING
STREET
DENTAL**





northumberland players

Northumberland Players is live, local and committed to bringing quality theatre to the whole family.

In its 43 years. Northumberland Players, a not-for-profit community theatre, has won numerous Theatre Ontario awards for performance, directing, music and production. Its active youth theatre program includes a major children's production presented every Christmas season and drama camps that run throughout the summer months.

Northumberland Players provides opportunities in all aspects of quality theatre. Over 300 enthusiastic, **un-paid volunteers**, who work as actors, directors, producers, set builders, costume makers, etc., are proof there is passion for live theatre in Northumberland County. By supporting our not-for-profit theatre company, your entertainment dollars stay in the community, creating cultural and economic benefits that ripple throughout our community.

Home for Northumberland Players is the historic **Second Street Firehall** in Cobourg. The **Firehall Theatre** is an intimate venue with comfortable seating that can be arranged in various configurations to present innovative theatre to smaller audiences. **Cobourg Costumes**, at 450 Campbell Street, Cobourg, houses the Players' vast collection of period and contemporary costumes, all of which are available for rentals. Northumberland Players also leases **The Third Space** on Loveshin Road for set storage and construction.

Over 11,000 people attended our productions last year. We hope this year even more will see our shows. We welcome members and volunteers to join us in the fun of producing quality theatre.

Be a Player - There are many roles!

Members have a voice in the operation of Northumberland Players. Individual Memberships are \$25. A Family Membership of \$40 includes spouses and, as non-voting members, children and youth.

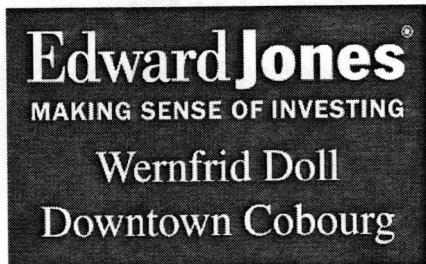
Volunteers participate in all aspects of community theatre: artistic, backstage, clerical, construction, production and/or technical roles. If you'd like to volunteer, sign up on the website as a volunteer and you will be contacted.

Donors and Sponsors provide financial support.

Visit www.northumberlandplayers.ca for more information, to donate and/or sign up. You can visit the Firehall office at 213 Second Street, Cobourg, or call 905-372-0577, or e-mail to info@northumberlandplayers.ca. We accept VISA and Master Card. The office is open 10 a.m. to 1 p.m. on Fridays.

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