

# Gladys A. Harvey:

## Canada's First Woman Radio Astronomer / la première Canadienne radioastronome

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### ABSTRACT

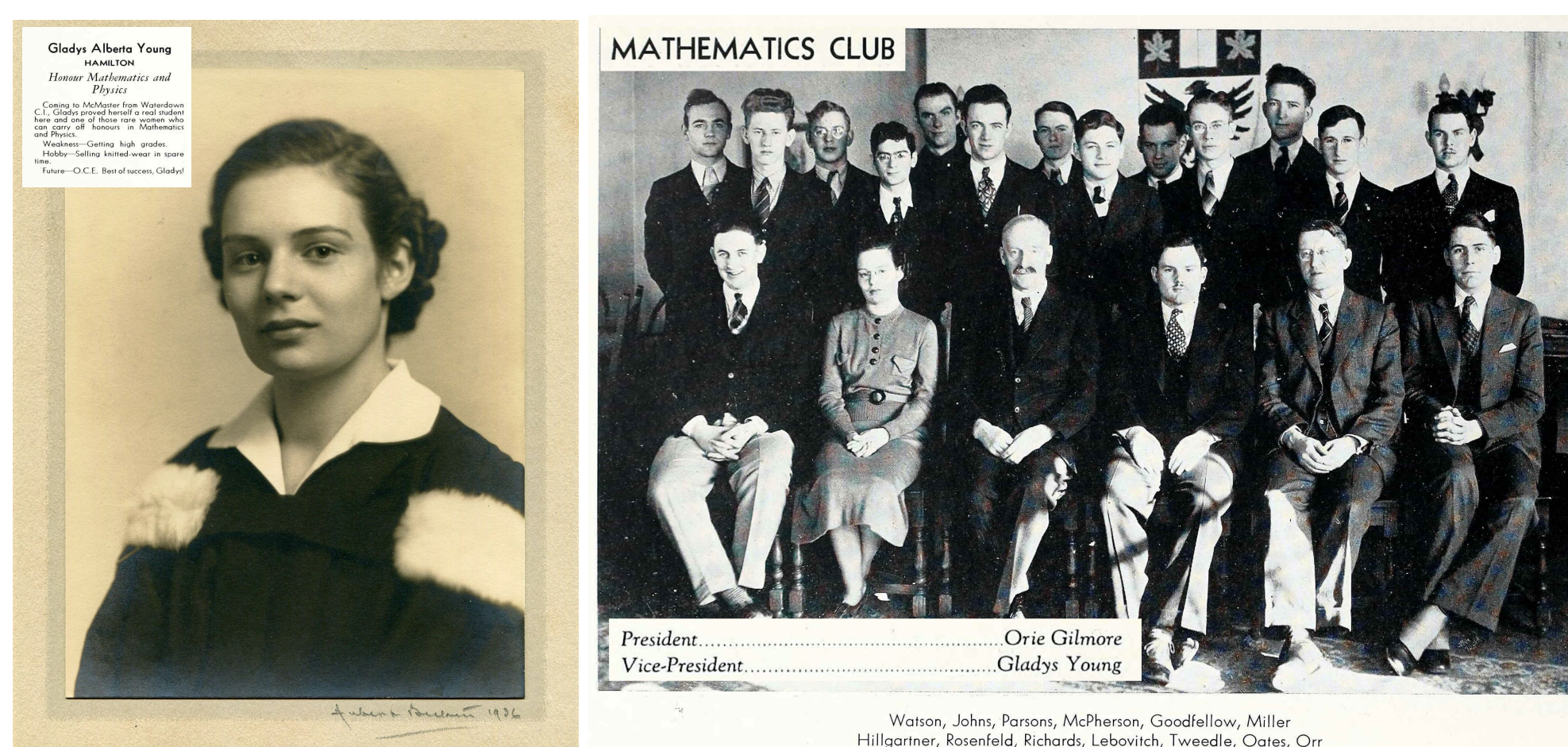
Gladys A. Harvey (née Young, 1916-1995) was a staff member of the Radio and Electrical Engineering Division (REED) of the National Research Council of Canada (NRC) from 1948 to 1976. Gladys received B.A. and M.A. degrees from McMaster University in the field of mathematics, and then received a teaching certificate from the Ontario College of Education. After a number of years working in education, she applied for a position at NRC where in March 1948, despite having no radio, electronics, or engineering expertise, she was immediately hired into REED based on the strength of her mathematics background. This was a couple of years after Canada's first radio astronomer, NRC's Arthur E. Covington, made the first detection of radio emission from the Sun, and despite having no prior experience or interest in astronomy, Gladys was assigned to work with Covington to conduct astronomical observations of the Sun at NRC's Goth Hill Solar Radio Observatory. Gladys spent many years at the observatory assisting Covington with instrumentation and observations before beginning to coauthor publications on astrophysical measurements of the brightness of solar radio emission at a wavelength of 10.7 cm, especially bursts of radio emission that coincided with solar flares from the surface of the Sun. This led to a single-author paper on this topic in the *Astrophysical Journal* in January 1964. Throughout the 1970s, Gladys worked with the NRC's 46-meter radio telescope at the Algonquin Radio Observatory, and her scientific interest shifted from solar radio emission to the search for variable radio emission from distant galaxies. We present an overview of Gladys's career and her research highlights, and we rely on family photographs and a recovered audio interview with Gladys to provide insight into her experiences as the first woman working in radio astronomy at NRC.

### RÉSUMÉ

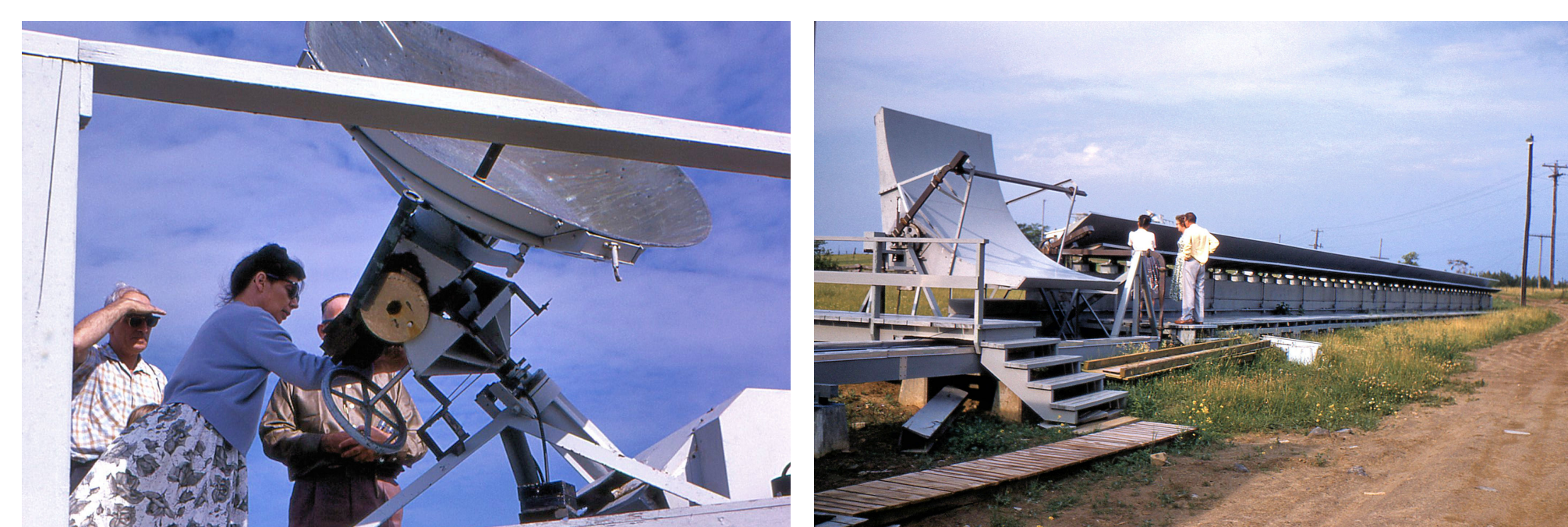
Gladys A. Harvey (née Young, 1916-1995) a fait partie du personnel de la Division de radiotechnique et de génie électrique (DRGE) du Conseil national de recherches du Canada (CNRC) de 1948 à 1976. Gladys a obtenu un B.A. et une M.A. en mathématiques de l'Université McMaster puis un brevet d'enseignement de l'Ontario College of Education. Après plusieurs années d'enseignement, elle postule pour un poste au CNRC. Son expérience en mathématiques lui vaut une embauche immédiate, en mars 1948, au sein de la DRGE malgré son manque d'expertise en radio, en électronique et en génie. Deux ans auparavant, le premier radioastronome du Canada, Arthur E. Covington, qui travaille à l'époque au CNRC, est le premier à détecter des émissions radio en provenance du Soleil. Bien que n'ayant aucune expérience antérieure ni aucun intérêt particulier pour l'astronomie, Gladys est chargée de collaborer avec Arthur Covington pour effectuer des observations astronomiques du Soleil à l'Observatoire de radioastronomie de Goth-Hill (CNRC). Gladys passera de nombreuses années à l'observatoire, aidant Covington pour l'instrumentation et les observations, avant de participer comme coauteure à la publication de plusieurs articles sur la mesure astrophysique de l'intensité des émissions radio en provenance du soleil à la longueur d'onde de 10,7 cm, en particulier celle des sursauts radio qui coïncident avec les éruptions observées à la surface de l'astre. Elle finit par publier un article en tant qu'unique auteure sur le sujet dans l'*Astrophysical Journal*, en janvier 1964. Dans les années 1970, Gladys travaille au radiotélescope de 46 m du CNRC à l'Observatoire radioastronomique Algonquin et son intérêt scientifique passe alors des émissions solaires dans le domaine radio à la recherche d'émissions radio variables en provenance de galaxies lointaines. Nous présentons un résumé de la carrière de Gladys Harvey et de ses succès en recherche et nous utilisons des photographies de famille et l'enregistrement audio d'une interview d'époque pour éclairer son expérience de première femme à avoir travaillé en radioastronomie au CNRC.

### EARLY LIFE AND EDUCATION

Gladys Alberta Young was born in Aldershot, ON, on 25 Sep 1916 and attended Waterdown High School in Hamilton, ON (Class of 1934). At age 16, Gladys attended McMaster University where she was vice president of the Mathematics Club and in May 1937 earned a B.A. with Honours in Mathematics & Physics. Gladys continued her studies earning an M.A. in Mathematics in May 1938 with thesis work on the Jacobi Differential Equation. Gladys then earned a teaching certificate at Ontario College of Education and taught high school at Leamington, ON, for 2 years before working as an inspector of Bofors anti-aircraft cannons at a war plant. From 1945-1947, she taught veterans returning home from WWII. At this stage in her career, Gladys was encouraged to apply to the NRC, and as she reports, "They didn't even look at me, they said 'Come.'"



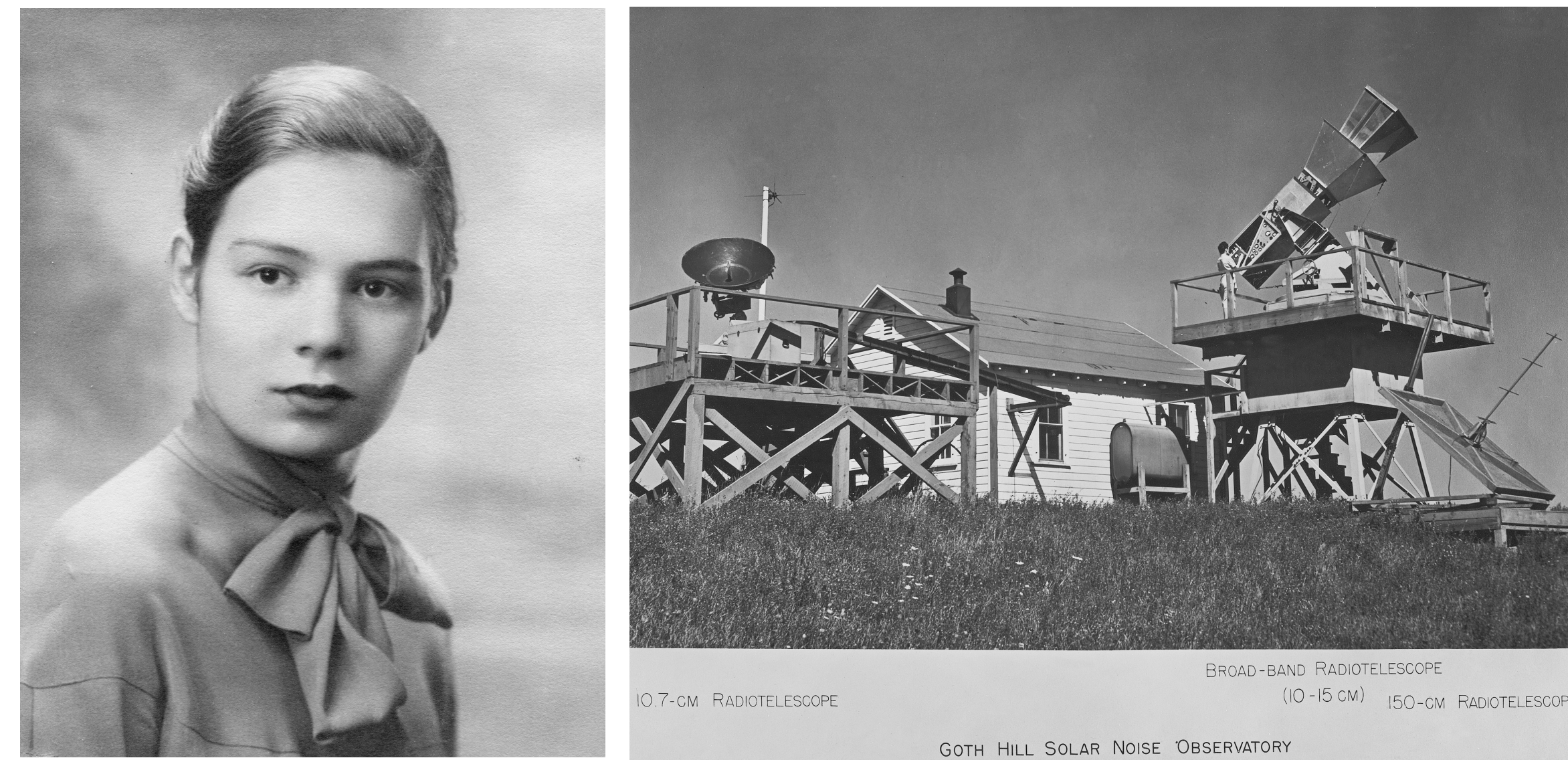
**Gladys A. Young at McMaster University**  
Gladys attended McMaster (B.A. 1937, M.A. 1938) where (left) she studied Math and Physics and (right) was vice president of the Mathematics Club.



**Gladys A. Harvey at NRC's Goth Hill Solar Radio Observatory**  
Gladys in 1964 showing (left) her brothers-in-law the 4-foot radio telescope and (right) an unknown couple the 150-foot slotted waveguide array that she operated. These are the only known colour slides of the Goth Hill observatory.



**Gladys A. Harvey at NRC's Algonquin Radio Observatory**  
Gladys (left) in 1966 operating (middle) the solar interferometer, which consisted of forty 3-meter reflector antennas along a 1-km east-west line. (Right) Gladys standing at the edge of the ARO 46-meter radio telescope.



**Gladys A. Young at NRC**  
(Top left) Gladys began working at NRC's REED in 1948. (Top right) Gladys operated the radio telescopes at the Goth Hill Solar Radio Observatory and worked with Canada's first radio astronomer, Arthur E. Covington. Gladys is seen in this photo, which was published as Fig 10.7 in *Cosmic Noise: A History of Early Radio Astronomy*, incorrectly attributing the person on the platform as Covington. (Bottom left) Gladys, with slide rule in hand, measuring solar radio intensity at a wavelength of 10.7 cm from strip charts. (Bottom right) NRC ID Badge for Gladys A. Young.

### NRC CAREER

Gladys Young began her career at NRC in March 1948. Despite having absolutely no previous interest or experience in electronics, radio, or astronomy, Gladys began as a Research Officer in the Radio and Electrical Engineering Division (REED), and was assigned to work with Canada's first radio astronomer, Arthur E. Covington, at NRC's Goth Hill Solar Radio Observatory in Ottawa, ON. She learned to drive a station wagon to get to the then remote observatory, and was given a tool kit and a pair of snowshoes so she could cross the observatory fields in the wintertime to maintain and operate the radio telescopes. Gladys married Garth Harvey (1921-2018) in 1952 and after 7 years of operating the Goth Hill radio telescopes, began co-authoring astrophysical research papers concerning her studies of radio bursts and flares from the Sun, and published a sole-author paper in the *Astrophysical Journal* in 1964.

Gladys worked at Goth Hill as part of the "Solar Patrol" for 20 years and then shifted her research work to NRC's Algonquin Radio Observatory (ARO) at Lake Traverse, ON. While at ARO, Gladys began working with NRC colleagues John MacLeod and Bryan Andrew in studying variable radio emission from distant galaxies using NRC's new 46-meter telescope. Gladys took early retirement in October 1976 and moved with Garth to Shawnigan Lake near Victoria, BC.

In 1991, Gladys and Garth were interviewed by York University professor of history, Richard A. Jarrell (1946-2013). By this time, Gladys was suffering memory loss from Alzheimer's disease, but Garth was able to fill in many details about Gladys's NRC career. From this interview:

- Garth explains that it would have been hard for Gladys to have had ambitions for climbing the ladder at NRC like her male colleagues because during the entirety of her career she had been appointed on an annual basis. Gladys didn't receive a salary comparable to her male colleagues until the end of her career. Gladys claimed that this never really bothered her because, "I've always liked to do some things the way I wanted to. [And NRC let me do that.]"
- When asked if she had been aware of being the only woman in radio astronomy in Canada for much of her career and whether she considered herself a celebrity in any way, Gladys responded, "I never considered myself [a celebrity]... it was just something you did. When we went down for lunch, I was the only female with all the males. I was always accepted. No problem at all when I was there. And they gave me a birthday do, which I didn't even expect, and the others were all men."

Gladys A. Harvey passed away on 14 Jan 1995 at the age of 78.

### Photos Taken by Gladys A. Harvey



### Gladys A. Harvey's Collaborations Brought Her to Many Observatories

(Top left) 250-foot telescope at Jodrell Bank Observatory, England, 1961. (Middle left) 28-foot solar radio telescope at the Harvard Radio Astronomy Station in Fort Davis, TX, USA, now part of NRC's DRAO Synthesis Telescope in Penticton, BC. (Bottom left) McMath Solar Telescope at Kitt Peak National Observatory, AZ, USA, 1968. (Top right) Top-secret Lockheed Rye Canyon Research Lab, Santa Clarita, CA, USA, where Gladys worked for 6 weeks. (Middle right) Peach Mountain Observatory 26-meter Telescope, MI, USA. (Bottom right) McMath-Hubert Solar Observatory, Lake Angelus, MI, USA.

### GLADYS HARVEY'S ECCENTRIC LIFE

In 1982, Gladys told her hometown newspaper, *The Cowichan News*, that she and her husband, Garth, "don't vegetate and we try to be as eccentric as we can." Gladys certainly lived an unconventional life and was a true polymath. To a person, former NRC colleagues have reported that they were unaware of Gladys's many extracurricular activities. Gladys:

- Studied music (piano) and bowled.
- Took flying lessons until the end of WWII.
- Shot with the National Defense Rifle Club.
- Was an amateur portrait painter.
- Studied with *Group of Seven* artist, A.Y. Jackson (1882-1974).
- Had an art exhibition at the Ottawa Bahá'í Centre.
- Acted in regional theatre (winning Best Supporting Actor).
- Wrote out a 2<sup>min</sup> 15<sup>sec</sup> solution to the Rubik's Cube in 1984.
- Took a drafting course so she could draw the plans for the family home outside of Ottawa, ON.



**Gladys A. Harvey**  
(Left) Gladys, center front row seated on ground, studying at Banff School of Fine Arts under A.Y. Jackson, seated on ground at left. (Middle) Gladys's solution to the Rubik's Cube. (Right) Gladys's hand-drawn plans for her family home.

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