

The Annals of Irish Mathematics and  
Mathematicians presents

## Pioneering WIMEN

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We survey 150 years of Pioneering WOMEN

## **Women in Irish Maths Exceeding Norms.**

*From the first half century (up to 1920) when women first dared to pursue maths past secondary school level, to the last decade or two when some—but hardly enough—have made it to the highest levels of academia in Ireland (and overseas).*

Before 1970, over 125 women in (or of) Ireland earned maths degrees, or were engaged in mathematical work of some sort.

The very early ones were educated privately. Of those who excelled at university, many didn't officially graduate: TCD didn't give women degrees until 1904, Oxford didn't do so until 1920, and Cambridge held out until 1948.

# Women in Maths—in and/or of Ireland

## A panorama covering the last 150 years



Includes Irish mathematical women, regardless of where they were educated or practiced their craft, together with women from abroad who've worked in maths related fields in Ireland.

We'll highlight numerous WIMEN sheroes deserving attention.

Very few of the pioneering WOMEN pre-1920 had the chance to enter academia; a high proportion of them became teachers.

Some of the early ones pursued astronomy, and some of those settled for publishing under their husbands' names.

Those who did start relevant careers almost always had them cut short if they married.

What follows is based on information buried in the online

**AIMM: Annals of Irish Mathematics & Mathematicians**

See the spin-off monthly blogs at [www.mathsireland.ie](http://www.mathsireland.ie).

And Tweets at @IrishMathsFacts (over 1000 followers).

## Our AIMM is true

Since late 2014, AIMM has tracked the academic profiles of thousands of Irish (or Irish based) people who pursued maths, dating back to the 1620s. Most are post 1800.

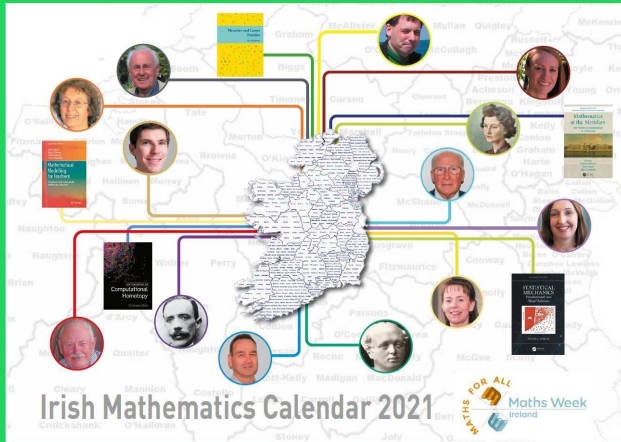
AIMM's reach is broad, embracing pure and applied maths, maths physics, theoretical physics, astronomy, and statistics, as well as actuarial science and maths education.

Over 900 relevant books are also documented in detail.

One goal is to account for the career of every third level Irish maths grad from the 1800s and 1900s and . . . .

Starting in 2016, annual Irish Mathematics wall calendars have been produced in association with Maths Week Ireland.

# Irish Maths Calendar 2021



Each highlights 72 people with photos and mini-bios, and lists many hundreds of birthdays and other dates of note. Also, each year the number of women featured increases.

## Data sourcing

Make extensive use of personal contacts as well as old university calendars and reports, and the web.

1. MacTutor website, and its Davis Archive (1878-1940)
2. The Math Genealogy Project: lists doctorates by institution, year, and advisor. No gender or nationality is indicated.
3. Many universities have online search engines allowing one to find theses done there. However, theses are often not classified by subject area, nor are advisors generally noted.
4. Some dept websites list their graduate degree recipients.
5. Genealogical resources: online family trees, census records, BMD lists, marriage announcements, obituaries, wills, probates, registered teacher listings, secondary school brags, etc.

## Philosophy: Shed Light on Hidden Figures

Leave no stone unturned, follow up on every lead or mention.

Process information received ASAP. Share freely: in the online “degree database” and in the more user-friendly monthly blogs.

Half of those blogs are Mary Mulvihill inspired “Atlas of Irish Maths” articles, spotlighting all people associated with Tyrone (June 2021), Offaly (April 2021), Clare (February 2021), etc.

From the beginning, a special effort has been made to account for as many women as possible. Other blogs have addressed:

*The Real First Irish Woman with a Doctorate in Maths?*  
*Sheila Power (later Tinney): Pioneering Irish Maths Physicist*  
*The First Irish Woman with a Doctorate in Maths*



# The Davis Archive

A good starting place for exploring early Irish maths women: the wonderful MacTutor website's Davis Archive (1878-1940) which "contains details of the approximately 2500 women who graduated in mathematics from universities in Britain and Ireland before 1940."

Entries are very brief:

*Wedgwood, Charlotte*

*Charlotte Louisa Ryles Wedgwood graduated from the Queen's University of Belfast in 1911 with a B.A. (Class: II)*

This archive misses a few graduates from Irish universities, and also contains Irish women who earned degrees from British institutions instead (those are much harder to spot).

## The First 55 Females: blog at [www.mathsireland.ie](http://www.mathsireland.ie)

We know of 55 relevant Irish women grads (or equivalent) pre 1921. Of those, 5 were “steamboat ladies,” who in the period 1904-1907 were awarded MA’s by TCD. (We are not counting another 7 non-Irish “steamboat ladies.”)

We know 14 of the 55 did research (7 via master’s theses).

21 = 9 + 12 got master’s (higher proportion than for men?).

40 of them taught in secondary schools, and 8 taught at third level, with some overlap. In total, 44 engaged in instruction.

We have photos of 18 of the 55 (so far).

27 of them were associated (at least in part) with Ulster.

26 of them are known to have married.

## WIMEN from before 1921: 1



Mary Clerke (1842-1907)

Born Skibbereen, Cork, and was educated privately, studying mathematics, physics and astronomy at the third level in Dublin, and later in Italy. Settling in London, she published extensively, wrote numerous popular and well regarded books on the history of astronomy, and contributed to the *Encyclopaedia Britannica* on both astronomy and mathematics.

## WIMEN from before 1921: 2



Sophie Wilcock (later Bryant, 1850-1922)

Born Dublin, when the University of London opened its doors to women in 1878, she seized the opportunity, and by 1881 had completed her BSc with first class honours in mental and moral science, and second class honours in mathematics. In 1884 she was awarded a DSc in 1884 in mental and moral science, becoming the first woman in Britain to be awarded a doctorate. She was the first woman to have a paper in the *Proceedings of the LMS* (1885).

## WIMEN from before 1921: 3



Alicia Boole (later Stott, 1860-1940)

Born to George & Mary Boole, grew up in Cork and London. She never attended university or held an academic position. Was a pioneer in the visualisation of 4-dimensional shapes rediscovered the six regular 4D polytopes. She coined the term *polytope* for these and higher dimensional analogues of polyhedra. Wrote book chapters (1888), later published many papers, the University of Groningen awarded her with an honorary doctorate in 1914. In the 1930s she worked with Coxeter.

## WIMEN from before 1921: 4



Alice Everett (1865-1949)

Born in Glasgow, and brought up in Belfast. She studied maths Queen's College, and at Girton College, Cambridge, but her BA and MA degrees were awarded by the Royal University of Ireland. She worked at the Royal Observatory in Greenwich, being the first woman paid to work there. Later did research in optics and the engineering of early television.

## WIMEN from before 1921: 5



Annie Russell (later Maunder, 1868-1947)

Born in Strabane, Tyrone, educated Girton College, Cambridge. In 1889 she was the highest ranked mathematics student at the BA examinations, also ranked Senior Optime (second class honours), but as a woman was denied a degree.

Did pioneering solar research at Greenwich Royal Observatory for decades, publishing her findings under her husband's name.

# WIMEN from 1920-1969: 1



Margaret Gough (*aka* Sister Mary de Lellis, 1892-1983)

Born in Kilmore, Wexford. Upon finishing school, she sailed to Texas to become a nun. Educated at Catholic Univ in DC (BA 1920, MA by thesis 1923, PhD 1931). Her doctoral thesis in algebra was done under Aubrey Landry. She seems to be the first "Irish to secondary level" woman to get a doctorate in pure maths. She taught at Incarnate Word College in San Antonio until 1943, and later worked for two decades as an accountant in Forth Worth.



## WIMEN from 1920-1969: 2



Muriel Kennett (brought up as Wales, 1913-2009)

Born in Belfast. Grew up in Vancouver, Canada. Educated at the University of British Columbia and the University of Toronto, where she earned MA and PhD degrees, respectively, both for research in algebra. She spent most of the 1940s working in atomic energy, in Toronto and Montreal.

## WIMEN from 1920-1969: 3



Sheila Power (later Tinney, 1918-2010)

Born Galway, where her father was prof of maths. Was educated at UCD and the Univ of Edinburgh, in 1941 becoming the first “Irish to third level” woman to get a doctorate in the mathematical science. She worked at DIAS and UCD, introducing generations of Irish students to quantum physics.

## WIMEN from 1920-1969: 4



Barbara Yates (1919-1998)

TCD grad, 1942. PhD in difference equations from Aberdeen in 1952, hence becoming the first “Irish to third level” woman to get a doctorate in pure maths. Spent her whole career at Royal Holloway.

## WIMEN from 1920-1969: 5



Siobhán O'Shea (later Vernon, 1932-2002)

Born Macroom, Cork. She was educated at UCC (BA 1952, MA 1954) and taught there for over 30 years. (Only the second woman maths sci UCC grad.) PhD from there (on analysis) in 1964, hence becoming the first “Irish to third level” woman to get a doctorate in pure maths from an Irish institution.

It was a collection of previously published papers.

## From 1970 on

Very gradually, over the past half century, more and more WOMEN have started playing fuller roles in academia (and elsewhere, e.g., in industry) both in Ireland and elsewhere.

For those at universities, this includes publishing papers, getting grants, and supervising postgrad and postdoc research.

Also, to a lesser extent, editing/authoring books at all levels, being on editorial boards, and serving in leadership roles.

Analyst Pauline Mellon from Wicklow (education and career at UCD) was the first Irish woman to supervise a pure maths doctorate in Ireland (Michael Mackey, 1999). She recently served as president of the Irish Maths Society.

Is WOMEN's work being adequately rewarded and recognised?

## The Present (and Future?) in Ireland:

*Some* encouraging signs: DIT, TCD, UL and NUIG have had a woman serve as head of relevant department or school.

WIMEN at the highest two ranks of professor (A and B)—traditionally Associate Prof or Prof, but now sometimes (e.g., at TCD, DCU, MU, UCD) denoted Prof or Full Prof, include:

Sally McClean (UU Coleraine, stats & informatics), Sara McMurry (TCD, quantum), Adele Marshall (QUB, stats & OR), Catherine Comiskey (TCD, biostats), Natalia Kopteva (UL, applied), Sinéad Ryan (TCD, theoretical phy), Sarah Mitchell (UL, applied), and Anne O'Shea (MU, complex analysis & maths ed).

(Plus some observational astronomers.)

## COVID-era congratulations to:

Very recently promoted to the highest rank of Professor:

Aisling McCluskey (NUIG, topology)

Claire Gormley (UCD, stats)

Norma Bargary (UL, stats)

New talent keeps popping up: TCD physics and astrophysics grad Emily Cannon, PhD student at KU Leuven in Belgium, is second author on paper “A dusty veil shading Betelgeuse during its Great Dimming” in *Nature* (June 2021).

Hopefully, a brighter future lies ahead.

## Caveats

While our focus has been on teaching, research, and academia, training in maths has always been excellent preparation for a wide variety of careers for women and men alike.

Irish mathsy women have pursued careers in the CSO, industry, the actuarial world, finance, etc. These all have doctorates:

Sarah Gallagher (Senior Meteorologist level for managing the Observations Division of Met Éireann)

Sandra Spillane (Observational Climatologist Met Éireann)

Helen Joyce (finance editor for *The Economist*)

Sandra Collins (director, National Library of Ireland)



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And to the Robert Boyle Summer School organisers for the opportunity to speak here today.

Dedicated to the memory and legacy of:



“Ingenious” Mary Mulhivill (1959-2015)

Pioneering Irish herstorian of STEM heritage  
and champion of forgotten women of note.

(see “Ingenious Mary: Innovative Irish Science Journalist  
Leaves a Formidable STEM Legacy” in the *Huffington Post*)