Australian National University

DR WANDA MAREE HENRY SCHOLARSHIP IN PHOTONICS

ANU College of Science

DR WANDA HENRY

Dr Wanda Henry was an outstanding scholar and photonics researcher at The Australian National University.

Wanda first came to ANU as an undergraduate in 1981 as the recipient of a prestigious National Undergraduate Scholarship for ANU. In addition to a full course load for her Bachelor of Science (BSc) degree in Mathematics and Physics, she taught dance in community venues, became an Explainer for Questacon science exhibits, and tutored in the Mathematics Department.

Wanda's honours project marked the beginning of her research focus upon optical communications. She began a long-term collaboration with Professor John Love, with whom she co-authored several papers in the following years. In 1984 she won firstclass honours and a series of awards and prizes, including the Tillyard Prize for the Bachelor with honours student making an outstanding contribution to University life.

She completed her PhD at the Optical Sciences Centre at ANU in 1988.

From there Wanda took up a Postdoctoral Research position at the University of Arizona (1988-1989) and a Research Fellowship at Kings College at the University of Cambridge (1989-1993). While in Cambridge, her theoretical work expanded to include experimental work with optical fibres.Throughout her postgraduate years she continued to publish her work and to build her professional network of research colleagues. She maintained an active lifestyle that included dance, swimming, and punting on the river Cam in Cambridge.

Wanda returned to Australia in 1993 to take up a lectureship at Latrobe University in Melbourne. Simultaneously she was a Visiting Fellow at ANU, maintaining ongoing research there in optical fibre sensing. She established a laboratory at Latrobe University and was poised to continue to make significant contributions in the areas of optical communications, optical sensing and biophotonics.

Tragically, Wanda was beset by health problems in 1996, and died unexpectedly in Melbourne in December, 1996. She was 34 years old. Her colleagues mourned not only her brilliance and excellence in her field, but her energy, enthusiasm and exuberance as a person.

From 1998 to 2012, her contributions at ANU were remembered through the Wanda Henry Prize, awarded to the top physics student who attended the Optical Communications course.

Since 2013, the Wanda Henry Scholarship in Photonics has been awarded to outstanding ANU undergraduates of physics and engineering to promote and assist their study of photonics.

During their undergraduate education and starting their careers, each of these young scientists are nurtured towards making unique contributions to ongoing innovation and discovery. These students benefit not only from the financial assistance and encouragement to delve deeper into this rich field, but from Wanda Henry's example. She excelled academically, intellectually and professionally – while balancing a wellrounded life and sustaining connections within her community.

ANU is grateful for the important philanthropic contribution of the Henry family. To underscore the lasting impact of this gift, we hope you enjoy these profiles and progress reports from the Wanda Henry Scholarship in Photonics recipients.

2013 RECIPIENT
BENJAMIN COURTNEY-BARRER

"From what I understand, Wanda was a very kind, caring and well-rounded person … This legacy of hers is an inspiration to me, and the whole experience of being awarded this scholarship has further fuelled my excitement to pursue my studies on photonics."

The inaugural Wanda Henry Scholarship in Photonics was awarded to Benjamin (Ben) Courtney-Barrer in 2013, then pursuing joint degrees in Science (Physics & Mathematics) and Engineering (Systems & Optical, Honours).

Ben excelled in multiple ways at ANU. He cofounded the World Solar Challenge program at ANU. By 2017 the ANU Sol Invictus team, made up of students from across the university, had built a solar car to race from Darwin to Adelaide.

On campus he served as tutor in systems engineering and physics, and as a research assistant at the Centre for Gravitational Physics.

Ben took opportunities to pursue his emerging interests in internships, first at the International Centre for Radio Astronomy Research in Perth. During a summer at the Gemini Observatory in Chile, he used photometric data to determine the age of a massive star cluster.

He is currently a telescope instrument operator for the Very Large Telescope (VLT) at the European Southern Observatory in Chile.

2014 RECIPIENT
BENNETT SCHNEIDER

"This scholarship afforded me the honour to associate with many prominent scientists at ANU, in particular the late John Love – an early pioneer of optical fibre communication technology."

Bennett Schneider holds Bachelor degrees in Engineering (Research and Development) and Science (Physics) from ANU. He majored in renewable energy and photonics.

As an undergraduate, Bennett was awarded the Wanda Henry Scholarship in Photonics after he demonstrated an interest in the applications of photonics to renewable energy. "My second year R&D project involved using mathematical modelling to trace the paths of light rays of different energies. This modelling was used to estimate the effectiveness of the design of a new type of solar cell, as a possible avenue for future research.

"This project culminated after almost a year and a half, and the results were promising enough to be published in the scientific journal, Optics Express."

The scholarship helped Bennett go on an exchange to Heriot Watt University in Edinburgh, where he studied nanophotonics, laser physics and renewable energy.

Before leaving ANU Bennett and three fellow students co-founded Pixelated Induction, a start-up to develop large-area wireless charging systems for mobile phones.

Bennett now works as a wind engineer at Windlab,a renewable energy development company in Canberra.

2016 RECIPIENT
LOGAN DAVIS

"The scholarship helped me by allowing me to do the research project at the University of Sydney over the summer – leading me to the project I'm working on now. Also it shifted me off my single-minded focus of 'go build some robots,' allowing me go explore different avenues in physics."

Logan Davis, from Canberra, is in his fourth year (out of five) working on a double degree of Bachelor of Science in Physics and Bachelor of Engineering, Research & Development.

In his second year, Logan completed a project in photovoltaics, developing a testing method for double-glass photovoltaic modules.

Leading into his current research, he worked on a project monitoring eye blinks as a possible means of identity biometrics.

His current research project uses behavioural biometrics. One outcome of the work would be creating an office chair that can recognize and authenticate the individual that sits there – based on data gathered by sensory fabric and "smart rubber" on the chair.

Logan specializes in mechatronic engineering – an adaptation of mechanical and electrical engineering, with robotics as a major application.

He's also devoted to the physics side of his double-major. He says "I'm really interested in photonics at the moment. I worked in waves and optics in 2nd year. I'm looking forward to theoretical physics next year."

He continues "If I'm doing two degrees I may as well do them both to their fullest. Engineering was always my career goal, and physics is something I was interested in as an add-on. But I've found that there is a lot of crossover."

Logan, who grew up playing soccer, stays active outdoors. He currently serves as captain of the ANU Quidditch team.

2017 RECIPIENT
MARIKA NIIHORI

"At the end of last year I had the opportunity to talk with the Henry family. I was very grateful and thankful, and I remember saying that I wanted to live up to Wanda Henry's name. They told me not to worry about living up to her example or making her parents proud. They said they would rather help me achieve my best."

Marika Niihori is in her third year working toward a Bachelor of Philosophy (Honours) flexible degree in science. This degree allows a lot of freedom in weaving coursework together to support research projects. She studied physics in high school, and at ANU she discovered an interest in biology. Combining the disciplines has led her into projects in biophysics and neurophotonics.

As part of her degree, Marika has conducted research projects at the Research School of Physics and Engineering – including modelling electromagnetic fields of neurons and a project on biosensors. She recently completed a neurophotonics project at the John Curtin School of Medical Research. She conducted neuronal imaging by electronically stimulating living neurons (rat brain cell cultures) to better understand their neuronal activity.

Marika says the scholarship's emphasis on photonics has helped her focus her interest within biophysics, which relies heavily on photonics and optics. Ultimately, she hopes a future career in biophysics research can impact human lives through finding cures for stubborn diseases.

Originally from Cairns, Marika plays piano and violin. She was last year's president of the ANU Music Society, and plays violin in the National Capital Orchestra. She's aware of following Wanda Henry's path in STEM. At one point she attended a biology class with mostly female students. "I felt out of place, if that makes any sense. It just shows that I've become used to being in a male-dominated STEM field. I don't think that's a good thing at all."

She addresses this issue as a member of the Fifty50 Society (which promotes equity in STEM) and by planning events about diversity in STEM in her capacity as vice-president of the ANU Physics Society.

2018 RECIPIENT
MICHI HARTNETT

"I am glad the Wanda Henry Scholarship spurred my interest in photonics, as it is a very important field that all physicists must have some understanding of."

Michi is in the third year of his Bachelor of Philosophy in Science degree. Multiple research projects undertaken during his studies have helped him develop a keen interest in nuclear physics.

One of Michi's projects involved research into the use of field-programmable gate arrays – special high performance processors for computing – in optical communications. He recently completed a project which utilised high-energy accelerators to analyse Italian palaeontological rock samples and determine whether the extinction of dinosaurs could have been caused by a supernova. His current project involves the simulation of nuclear reactions to determine the best possible methods for particle treatment of cancers.

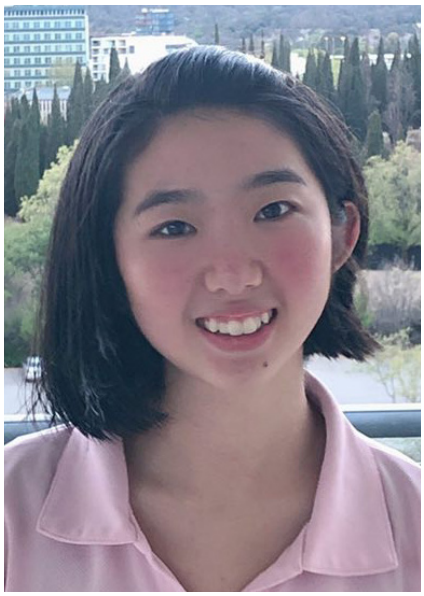
"Photonics can be quite prevalent in nuclear physics, as it can be particularly important in the management of radiation safety," says Michi.

"I am glad the Wanda Henry Scholarship spurred my interest in photonics, as it is a very important field that all physicists must have some understanding of."

Michi also has a keen interest in History and took several elective courses in modern history.

On completing his degree, Michi plans to either serve as a member of the Australian Defence Force or work for a defence-related firm involved with research in physics. He hopes to come back to ANU later to pursue a PhD.

2019 RECIPIENT
ISABEL XU



"The Wanda Henry Scholarship has provided me with opportunities to discover fascinating photonics applications, including in medical imaging, high-precision sensing and spectroscopy."

Isabel is currently a second-year Physics major enrolled in the Bachelor of Philosophy (Honours) degree. She initially aspired to major in pure maths. However, after using mathematical tools to draw connections between abstract concepts, she was able to develop a deeper appreciation for their applications in physics.

Isabel is aware of the versatility of photonics in a world which relies heavily on optical methods and lasers for research.

"The Wanda Henry Scholarship has provided me with opportunities to discover fascinating photonics applications, including in medical imaging, high-precision sensing and spectroscopy," she says.

As part of her degree, Isabel is completing an optics research project with the Department of Quantum Science. The project is motivated by a need to develop methods of high-precision measurements and aims to stabilise the frequency of a laser through interference from a device of a stable frequency – an optically referenced comb set to the accuracy of an atomic clock. Using LabView, she set up feedback loops to lock the laser frequency onto the comb.

She has also been chosen as a photonics ambassador, after leading students at the Beijing Institute of Technology (BIT) on a 2-week long workshop on recovering injected signals using a Michelson interferometer.

Isabel has a passion for science communication and enjoys writing a blog on science history. She also loves learning new languages, which she says helped her gain new perspectives and appreciate different ways of life.

AWARDS & SCHOLARSHIPS

Wanda Henry's legacy has been shared through a series of awards and scholarships to promising students, recognizing their common interest in science and photonics, and helping them realize their full potential.

The Australian National University - Wanda Henry Prize Winners

1998 Kallista Stewart
1999 Shayne Bennetts
2000 Not awarded
2001 Benjamin Sheard
2002 Not awarded
2003 Erin Stonestreet
2004 Matthew Davis
2005 Sheon Chua
2006 Michael Kubista
2007 James Ridgway
2008 Niko Eckerskorn
2009 Nicolas Riesen
2010 Sajjad Shahrabi Farahani
2011 Michael Copeland
2012 Not awarded

The Australian National University - Wanda Henry Scholarship in Photonics

2013 Benjamin Courtney-Barrer
2014 Bennett Schneider
2015 Not awarded
2016 Logan Davis
2017 Marika Niihori
2018 Michi Hartnett
2019 Isabel Xu

Aldridge State High School - Dr Wanda Henry Memorial Award

2013 Meg Burstow
2014 Kristen Ethell
2015 Rowan Pienaar
2016 Ryan Dodd
2017 Jun Guilfoyle
2018 Hannah Karrasch
2019 Jay Paton

Awards, scholarships and prizes in Wanda's name have also been granted through LaTrobe University and the Australian Conference on Optical Fibre Communications (ACOFT) – each of these a home to her educational and professional achievements in addition to ANU. These gifts have had a lasting impact on dozens of students.

Photo above: As a research student in her office at ANU in 1986. Image from the Dr Wanda Maree Henry biography on **physics.anu.edu.au/engage/giving/wanda_henry/**

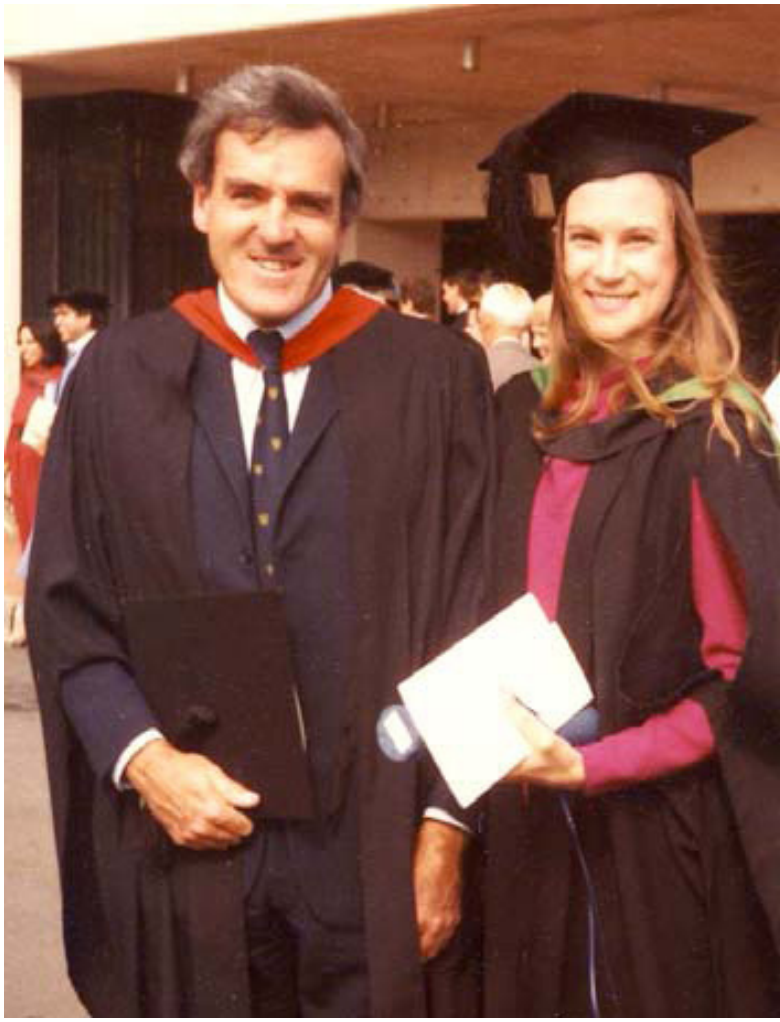


Photo above: Degree Day 1984 at ANU with honours' supervisor Dr John Love. Image from the Dr Wanda Maree Henry biography on **physics.anu.edu.au/engage/giving/wanda_henry/**

WANDA HENRY ENDOWMENT

Wanda Henry was an outstanding young Australian woman scientist. Many past students studying at the ANU College of Science, Department of Physics have benefited from the support which the Wanda Henry Endowment has afforded.

We are seeking support from a range of interested individuals, companies and the community to build on the resources available, award additional prizes, and to develop new scholarships in optical communications – an exciting and applied field.

Join Us

If you are interested in contributing to the Wanda Henry Scholarship in Photonics, we would be pleased to discuss any questions you may have.

We look forward to working with you.

CONTACT US

Kellie Ann Aki Takenaka
Development Manager
ANU College of Health & Medicine
ANU College of Science

M +61 447 062 124
E kellie.takenaka@anu.edu.au

ADV_1019_0192