Canberra astronomer becomes first Australian to win major US science award in 133 years

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2020 James Craig Watson medal winner Professor Lisa Kewley in her office. Credit: ASTRO 3D

Lisa Kewley has transformed our understanding of the early years of the

Universe, the development of galaxies, and what happens when they collide.

For her pioneering investigations across theory, modelling and observation, she will receive the US National Academy of Science's biennial James Craig Watson Medal in Washington DC.

"At school I thought physics would be too hard. But I had a wonderful physics teacher whose love for astronomy was contagious!" says Lisa.

Today, Professor Lisa Kewley is Director of the ARC Centre of Excellence for All Sky Astrophysics in 3-D (ASTRO 3-D) and ARC Laureate Fellow at the Australian National University's Research School for Astronomy & Astrophysics. She is the first person in Australia and the Southern Hemisphere to be awarded the James Craig Watson Medal.

In awarding her the Medal, the Academy recognised the global impact of her research on our understanding of how galaxies have formed and evolved over the past 12 billion years.

"Now we understand how to make a computer model of the impact of star formation and supermassive black holes on their host galaxies," says Lisa.

"We can run the model forward and see how we expect galaxies to evolve, and we can go backwards and see how galaxies like the Milky Way formed, shortly after the epoch of reionisation, when the early Universe lit up."

She says we're living in a golden era for astronomy: "Early in my career I benefited from the Hubble Space Telescope and the 10 metre Keck telescopes in Hawaii. Students starting today are going to have access to amazing new telescopes including the James Webb Space Telescope,

massive new optical telescopes in Chile and the Square Kilometre Array in Australia and South Africa.

Professor Lisa Kewley is the first Australian ever to win the James Craig Watson Medal for outstanding contributions to astronomy. Credit: ASTRO 3D

"We're going to require astronomers, engineers, data experts and artificial intelligence to use these new instruments, taking us back to the moment of the Big Bang, finding new planets and more."

During her career, Professor Kewley has made fundamental contributions to the study of galaxy collisions, cosmic chemical abundances, galaxy energetics, and the star-formation history of galaxies.

Her widely cited papers cover the development of theoretical models to identify the power sources of galaxies, deriving the first star-formation rate calibration to correct for chemical abundance, revealing the distribution of oxygen abundances left behind by colliding galaxies, showing that low-ionisation nuclear emission-line regions are powered by super-massive black holes, and measuring the oxygen history of the universe.

"I am deeply honoured to have been awarded the James Craig Watson Medal," Dr. Kewley says.

"It speaks to the strength of astronomy in Australia. In pursuing my academic passion, I have been fortunate to be able to collaborate with many talented and insightful scientists. I am also grateful that my work has been supported by the Australian National University, by ASTRO 3-D, and by funding bodies such as the Australian Research Council."

Professor Kewley is currently researching the oxygen history of galaxies like the Milky Way.

"This award is highly-deserved recognition of Lisa's stellar research and the incredible contributions she has made to our understanding of the Universe," comments Professor Brian Schmidt, who was awarded the Nobel Prize for Physics in 2011 and supported the nomination.

"Here at ANU, we push the boundaries of what is known every day. This includes our place in the Universe. The work of Lisa and her colleagues position Australia as a world-leading centre for astronomy. I congratulate Lisa on this richly-deserved recognition."

Named after American-Canadian nineteenth century astronomer James Craig Watson, the award has been presented every two years since 1887 "for outstanding contributions to the science of astronomy". It comprises

a $US25,000 personal endowment, $US50,000 for research support and a gold-plated bronze medal.

Provided by ARC Centre of Excellence for All Sky Astrophysics in 3D (ASTRO 3D)