

IRISH ASTRONOMICAL ASSOCIATION 46th AGM 26th AUGUST 2020

SECRETARY'S REPORT:



Dear IAA Member,

I hope you are all keeping well amidst these unusual times. As you can see in the lecture summary below, another excellent season was underway with terrific member turnout for our range of unique lectures covering all aspects of astronomical and scientific knowledge, until the COVID-19 virus forced the remaining two lectures and the AGM to be cancelled. Thanks to Brian for his role as President and Membership Secretary for chairing the lectures, providing the printed newsheets and Paul who is also the Webmaster for the excellent new modernised IAA website and for presenting his 'The Sky' talks online each month throughout the pandemic. Credit to Terry for arranging the lecture programme for this season up to March and for his newsletter emails. Praise to Vice President Andy for producing the excellent 'Stardust' Magazine and to everyone who has contributed, which is quarterly posted to over 200 of our members. Applause to Pat for continuing his Treasurer position and to Vice President Danny for co-ordinating the Stardome at the various outreach events, helped by all members of the Council. A big thank you to QUB for accommodating the lectures and for their support. Finally, thank you to all our members, old and new, for your support which makes the association what it is today. Hopefully circumstances will change in the near future and we will be able to continue the lectures and outreach events as before.

Clear skies & best wishes.

Tony Kempston.

24th August 2020.

IAA Lecture Programme Summary 2019-20:

<p>01. "1969; a special year for space rocks and not just from the Moon)": 25/09/19 <i>Dr Mike Simms, Ulster Museum</i> The first of the IAA public lecture series, Mike begins by detailing the 3 very significant meteorite falls, Bovedy in Northern Ireland, Allende in Mexico and Murchison in Australia, which coincidentally occurred in the same year as the Apollo moon landings, that brought us our first rocks from the Moon. These meteorites brought important discoveries; including 9 new minerals discovered from the moon rocks, and the discover that meteorites in Antarctica are all discovered in one place as they are moved by ice to one place.</p> <p style="text-align: right;"><i>Total Attendance: 82</i></p>	<p>02. "Measuring the brightness of stars from space: flares, outbursts, exoplanets and the inside of stars" 09/10/19 <i>Dr Gavin Ramsay, AOP</i> Dr Gavin Ramsay, in his lecture, focused on how astronomers can answer important questions by measuring the brightness of stars, and how amateur astronomers have played an important part in the process. Gavin started the lecture by discussing ground and space telescopes, and the reasons why we put telescopes in space, such as being able to peer inside stars by measuring small amplitude variations in their brightness. In his interesting lecture, he also discussed the benefits of making the observations from space and gave examples of the amazing science that has come from space telescopes such as TESS and Kepler, alongside the future PLATO mission.</p> <p style="text-align: right;"><i>Total Attendance: 71</i></p>
<p>03. 'Looking for rings and gas around exoplanets': 23/10/19 <i>Dr Ernst de Mooj, QUB</i> Dr Ernst de Mooj's fascinating lecture focused on exoplanets, particularly how we can find planets, study their atmospheres and how we can move forward to search for rings around planets outside of the Solar System. The first exoplanet was discovered 25 years ago, the discovery has since won this year's Nobel Prize. There are now over 4,000 exoplanets known, with over 3,000 confirmed; with a range of sizes, masses, orbital periods and temperatures. They orbit a variety of stars, some similar to the Sun and some vastly different, and also come quite close to Earth. We have also been able to start probing their atmospheres, with a potential giant ring system with a diameter of approximately 90 million kilometres.</p> <p style="text-align: right;"><i>Total Attendance: 68</i></p>	<p>04. 'Backyard science for the amateur astronomer- research isn't just for the professionals!' 06/11/19 <i>Mike Foylan, Cherryvalley Observatory.</i> Mike Foylan established the Cherryvalley Observatory in Co Meah in 2010 as an amateur astronomer. He began his interesting lecture by explaining the different types of asteroids and Near Earth Objects. He then explained what is required as an amateur astronomer to observe and discover asteroids, including telescopes, mounts, filters, stable base and various software such as 'sky6pro', and how to gain an observatory code. He finished the lecture by showing how to get work published.</p> <p style="text-align: right;"><i>Total Attendance: 57</i></p>

<p>05. New Perspectives Big and Small of the Trans-Neptunian Region': 20/11/19 <i>Dr Meg Schwamb, QUB</i> Dr Meg Schwamb began her unique lecture by explaining what the Trans-Neptunian region is, a sea of small bodies past Neptune including larger objects like Pluto and Eris. She then discussed the structure of Kuiper Belt-Plutinos, including the changing planetary architecture and how most have moons (Makemake). She then discussed the New Horizons Probe that gave us a new understanding of Trans-Neptunian objects, such as Pluto. She finished the lecture by explaining what could come in the future; the LSST (Large Synoptic Sky Survey Telescope) expected to launch at the end of 2022.</p> <p style="text-align: right;"><i>Total Attendance: 69</i></p>	<p>06. 'The shaping of planetary nebulae': 04/12/19 <i>Dr Matt Redmond, NUIG</i> Dr Matt Redmond began his interesting lecture by giving examples of various nebulae and showing the Hertzsprung-Russell diagram and highlighting where different types of stars are on the diagram. He then explained the diffraction grating for light emitted by gas, what the spectrum means; including spectral lines and the Doppler effect and to work out how fast nebula is expanding. He finished by showing different telescopes and projects are working to further the research into planetary nebulae, including ALMA in Chile and LOFAR.</p> <p style="text-align: right;"><i>Total Attendance:60</i></p>
<p>07. 'The Cosmic Compass' 18/12/19 <i>Brian Beesley</i> 'Deep Sky Astrophotography with a Small Telescope': <i>Adam Jeffers</i> The last lectures of the year were organised in a "Member's Night". The first lecture was given by Adam Jeffers, Adam began his lecture by explaining what astrophotography is, the different types and the challenges that come with this. He then went through each of the equipment needed; telescope, mount and camera, and gave advice for each of the equipment needed. He finished by explaining what happens when processing the images. The second lecture was given by Brian Beesley. He began by giving a description of how astronomy has been used to find where you are and what direction your moving in, starting in the 6th Century with St Brendan. He then explained various cosmic instruments; including a Viking Analogue Compass, Sunstone and Sextants. He then gave descriptions of the basics of satellite navigation together with how this technology developed from WWII radio navigation and blind bombing raids.</p> <p style="text-align: right;"><i>Total Attendance: 47</i></p>	<p>08. 'The Terra Hunting Experiment – finding Alien Earthlike Worlds' 04/12/19 <i>Dr Chris Watson, QUB</i> The first lecture of the year, Dr Chris Watson began by discussing how exoplanets are found. However, there are many both technical and astrophysical challenges of finding exoplanets that are Earth-like. There have been planets discovered that are at first glance Earth-like, being Earth-size, Earth-mass and Earth-density, but are all in tight orbits around their stars. These challenges led to the 'Terra Hunting Experiment' being born; a 10 year long intensive survey of around 40 solar-type stars to look for the signature Doppler-wobble of an Earth-like orbit around a solar-type star.</p> <p style="text-align: right;"><i>Total Attendance: 57</i></p>
<p>09. 'Return to the Moon' 22/01/20 <i>Dr Andy McCrea</i> 'The Closest Comet Approaches to Earth': <i>Terry Moseley</i> Another double lecture, Dr Andy McCrea was the first lecturer. He began by discussing the Apollo 17 mission on the December 14th, 1972. He discussed the reasons why the Apollo missions stopped; there was a lack of money, they achieved their aims, no strategy and public interest disappearing. He then reviewed what has been going on in terms of lunar missions since then; touching on various missions from NASA, China, Japan and India. He then reviewed the current situation; including the NASA-led Artemis missions and Elon Musk's Space X being a new contender in Space Travel. The second lecture was given by Terry Moseley. Terry began by giving examples of comets and their structures and orbits. He then discussed how accurate records for comets are; He finished by giving examples of close comet encounters and considered the effects of a possible close pass in the future.</p> <p style="text-align: right;"><i>Total Attendance: 74</i></p>	<p>10. 'Rare but important: Why the Universe Is shaped by massive stars' 05/02/20 <i>Dr Andreas Sander, AOP</i> In this unique lecture, Dr Andreas Sander discusses massive stars in the universe. He begins by giving an outline of the role and impact massive stars have in the universe. Their extreme conditions allow them to breed and distribute heavier elements, as we now have the elements here on Earth that allow our existence. They also shape their environment illuminating fascinating nebulae that can become birthplaces for the next generation of stars and provide the radiation that makes the Universe transparent. Eventually, massive stars collapse into black holes, making them the progenitors of the Gravitational Wave events we are finally able to measure. He then explains the basic concepts of massive star evolution and highlights the role of the enigmatic Wolf-Rayet stars, which mark a crucial stage on the road to massive black holes.</p> <p style="text-align: right;"><i>Total Attendance: 62</i></p>

<p>11. 'The First Stars in the Universe' 19/02/20 <i>(part of N.I. Science Festival, NISF)</i> <i>Dr Laura Murphy, TCD</i> Dr Laura Murphy began her interesting lecture by explaining the basics of what a star is-a ball of hot gas held together. She then goes on to discuss the details of the massive stars that were there at the beginning of the Big Bang. The more massive a star, the more supernovas, neutron stars and black holes. She then details the Stellar Evolution Modelling process, which gives us the critical understanding of the early universe and how early stars formed. Through this modelling we can understand how they evolved, including rotation, mass loss and heavy element production can be used to predict final fates, effect on environment and even observations.</p> <p style="text-align: right;"><i>Total Attendance: 165</i></p>	<p>12. 'Gamma-ray and Optical Astronomy With VERITAS' 04/03/20 <i>Dr John Quinn, UCD</i> Dr John Quinn began his lecture by introducing VERITAS, the Very Energetic Radiation Imaging Telescope Array System, located in Southern Arizona and in collaboration with 25 universities. He then discusses gamma rays; what they are, when they were discovered and how they are detected. However, when the highest energy rays are detected, it produces showers of secondary emissions. He explains how the VERITAS system works and the science it produces, including the work for science other than gamma rays, including on fast transients and interferometry.</p> <p style="text-align: right;"><i>Total Attendance: 51</i></p>
<p>13. TBC 18/03/20 <i>Prof Peter Gallagher</i> Cancelled due to the COVID-19 pandemic</p>	<p>14. TBC 01/04/20 <i>Dr David Jess, QUB</i> Cancelled due to the COVID-19 pandemic</p>
<p>15. 46th Annual General Meeting 'Apollo- The Rest of the Story' 15/04/20 <i>Paul Evans</i> Postponed due to the COVID-19 pandemic</p>	<p>With thanks to all the staff at the Astrophysics Research Centre QUB for facilitating the events.</p>

Remember to visit the IAA website 'irishastro.org' for any future updates.

IAA Outreach Events 2019-20:

<p>1. IAA Midsummer BBQ. 15/06/19 <i>Delamont Country Park, Downpatrick</i></p>	<p>2. North Coast Festival: 06-07/07/19 <i>Maritime Festival, Portballintrae.</i></p>
<p>3. Moon Apollo 50th Anniversary Lecture & Exhibition. 03-31/08/19 <i>Bangor Carnegie Library, Co. Down.</i></p>	<p>4. Transit of Mercury. 11/11/19 <i>Various events throughout N.I.</i></p>
<p>5. Telescope Workshop. 30/12/19 <i>Armagh Planetarium, Armagh</i></p>	<p>6. New Year Party/Cinema. 04/01/20 <i>Tudor Cinema, Comber.</i></p>
<p>7. IAA at St Patrick's Academy. 31/01/20 <i>Dungannon. Co.Tyrone.</i></p>	<p>8. Marble Arch Caves/Geopark (NISF). 14/02/20 <i>Florencecourt, Co. Fermanagh.</i></p>
<p>9. QUB Astronomy Event (NISF) 22/02/20 <i>QUB, Belfast.</i></p>	

Thanks to all our members and guests for participating in the outreach events.

IAA Observing at Delamont Country Park, Killyleagh 2019-20:

28/10/19			
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Thanks to Paul, Danny and Ivan for organising the observing sessions at Delamont.

Tony Kempston.
24th August 2020.