Volume 37 No 1 March 2024

IRPS Bulletin

Newsletter of the International Radiation Physics Society

View of the aurora borealis resulting from the massive solar flare of March 2023 taken through an arch way in a quasi-Neolithic Henge at Raufarhofn, Iceland

Photograph: ***NASA Taken***: *March 2023*

Current IRPS Council Members 2021-2024

Contents of this Journal

Editorial

Greetings from the IRPS Bulletin Editorial team and from New Zealand! I have recently relocated to Auckland, New Zealand. A primary focus of this Bulletin is the solicitation of nominations for the 2025-2027 IRSP Council Board, with all positions from the President to executive councillors open for contest.

The IRPS Bulletin aims to be both informative and dynamic. To achieve this, we invite members to contribute news items from their institutions and countries for the "News from the World" section. We enthusiastically welcome missions of concise articles from established scientists and especially their students. This presents an ideal platform for students to showcase their research findings.

Chanh Tran and Chris Chantler are overseeing the management of the Society's website to facilitate its global outreach endeavours.

The upcoming scientific meetings are as follows:

1. ISRP-16 (2024, Lisbon) - Luísa Carvalho/Isabel Lopes
2. IRRMA-12 (2025, Riyadh) - Mohammed Alkhorayef

We reiterate that the strength of the society lies in its diverse interests across all facets of radiation physics: from Astronomy to Zoology. The Bulletin warmly invites contributions from all society members to highlight recent research within their respective fields of radiation physics.

As well, we intend to have a new section, Member Profiles. In this we celebrate successes of members who have received awards for the work that they do. Please see the Notice later in this Bulletin, (Page 7)

Ming Chew

COVER PAGE CAPTION

Can be found on page 4

From the President

Dear All

I am writing this following the successful IRRMA-11 meeting held in Bologna, Italy, last July and the equally successful ICDA-4 in Valencia, Spain, in September. Both events were vibrant and dynamic scientific meetings, showcasing engaging discussions and lively exchanges among participants. While IRRMA is a well-established scientific meeting with a longstanding history, ICDA-4 represents the newest addition to the series of conferences sponsored by the Society. The success of ICDA-4 reaffirms that the inception of the ICDA series was a well-timed and strategic move. It's worth noting that this initiative was spearheaded by Ladislav Musilek, who organized the first ICDA in Prague in 2013. I would like to express my sincere gratitude to all who contributed to the success of IRRMA-11 (thanks Jorge Fernandez and his team!) and ICDA-4 (thanks Gúmer and Bélen and their team!) and eagerly anticipate our ongoing collaboration in future endeavours.

Looking ahead, we will have the opportunity to meet again, share experiences, research results and plans at ISRP-16 in Lisbon, Portugal, from 1 to 5 September 2024 (https://isrp16lisbon.com/registration/) . Lisbon, with its rich cultural heritage and vibrant atmosphere, provides an ideal backdrop for our gathering. Its accessibility from around the world ensures that attendees can easily join us for this exciting event. I urge you to mark your calendars, submit abstracts, and make travel arrangements well in advance to ensure your participation. The abstract submission deadline is 1st May 2024.

I am also pleased to announce that our website has a new web address, made possible through the dedication and exemplary service of Tran Chanh. The new address is http://radiationphysics.org. While the content remains the same for now, we have plans to refurbish the site. This platform can serve as a hub for sharing news, updates, and resources relevant to our community. I encourage all members to actively engage with the site by submitting news items for publication. Kindly direct any submissions to Tran, who is currently overseeing the website.

Finally, as we prepare for upcoming elections before ISRP-16, I would like to emphasize the importance of active participation from all members to uphold the vitality and strength of our society. Your engagement and contributions are essential to our continued success, and I encourage each of you to cast your vote when the time comes.

Together, we will continue to advance our field and foster a vibrant scientific community.

It is planned that the official election slate appear in the next issue of the IRPS Bulletin, obtaining returns prior to ISRP-16. The result of the election will be announced during the ISRP-16.

Warm regards,

Isabel

COVER PAGE

Aurora Borealis viewed through an arch in a quasi-Neolithic Icelandic Henge (Raufarholm)

Cover pages are most commonly used to attract the attention of readers to a significant item of interest in the document. In this case the intention is to stimulate interest of readers of more generally: the relevance to radiation physics is not immediately obvious.

The immediate impression of the photograph is of the extent and beauty of the aurora. This is enhanced by the massive stoneworks which seem to direct the eye to the aurora. Tourists travel to the Nordic countries to view the auroral display. Their interest ceases after they have taken the mandatory selfies: their minds do not contemplate the how and the when and the why of what they see.

Most people do not realize the extent to which instabilities in the sun affect their lives. The most common solar events include: sunspots, dark regions on the surface the number of which is quasiperiodic (~11 years) and which is linked to rainfall; spurts and other emissions of radiation; and solar flares. Solar flares are massive emissions

of highly energetic charged particles which would destroy all life on earth if the earth did not have a magnetic field. The magneto-sphere diverts most of the particles, but what penetrates manifests itself in radiation showers, with associated disruptions to telecommunications, possible outages in large electricity distribution networks, and increased radiation dosage to lifeforms of all types.

The solar image shown is that of the 23 December 2023 flare (NASA).

Henges are structures, with or without associated earthworks, usually circular or elliptical. which were built in the Neolithic (8000 to 3500 BCE) and Early Bronze Ages in Europe. The most well-known henges are Stonehenge and Avebury in the UK, although henges are found in Brittany (France) and moving northwards, England, Scotland and its associated islands (Shetland, for example). Modern archaeological techniques such as satellite imaging, and the use of advanced analytical techniques to study materials and artefacts, have improved our understanding of the structures of henges. It is sometimes asserted that henges are ceremonial sites built by the Celts, who migrated from Anatolia about 1200 BCE, and who colonized what is referred to as the British Isles. But many of the henges predate the Celtic migration.

The henge in the photograph is a modern construction at the North Islandic fishing village of Raufarhofn. It is conceived of as a monument to Norse pagan beliefs. Specifically, the piece was inspired by Völuspá, a poem from Edda, the 'Bible' of Norse Mythology. The word, Völuspá translates to: *the Prophecy of the Seeress*. The project was initiated by Erlingur Thoroddson in 1996, construction commenced in 2004, and it is still being constructed. The henge has a diameter of 52m.

As the adage goes: a picture is worth 1000 words. And generates as many questions to be answered, not the least of which involves the separation of fact from fiction.

Commentary by Dudley Creagh

Vice Presidents' Reports

From Mohamad Gomaa (Vice President, Africa and the Moddle East)

News from Egypt (2022-2024)

Among the Radiation Physics and Radiation Protection regional activities after CRONA period (2022 till 2024), two seminars and one workshop were organized within Egyptian Atomic Energy Agency site.

In 2022 First Radiation Physics Seminar was carried out during November 2022. In March 2023 the first Radiation Protection Seminar was also conducted. In September 2023 the first Radiation Protection workshop was organized.

The second Radiation Protection Seminar is entitled {Requirements for Nuclear and Radiation Safety}, to be held in Cairo (16-17 April 2024).

Please see Copy of 2nd Radiation Protection workshop circular (Below),

---

Egyptian Atomic Energy Authority

National Network of Radiation Physics

The National Network of Radiation Physics And Protection of Egyptian Atomic Energy Authority Organization

April 2024 Work shop

Requirements of Nuclear and Radiation Safety

The organizing committee of the workshop interested professional in the nuclear and radiation fields. The respected radiation Protection experts and Radiation Protection officers, radiation protection mangers and users of radioactive materials.

Workshop program include beside definition of nuclear safety and nuclear safety, summary of regulatory law of nuclear and radiation activities, Personnel Licenses, requirements for site licenses for medical and non-medical facilities and regulatory inspection of facilities.

The workshop shall be conducted at Atomic Energy Authority site from 16-17 April 2024.

Workshop fees are 1500 Egyptian pounds for Egyptian and 200 Euro for non-Egyptian participants. Workshop fees to be paid to Atomic Energy Authority treasury.

For participation please contact the workshop chairman at Workshop WhatsApp group site (Requirements of Nuclear and Radiation Safety).

Last date for participation is 16th March 2024 and for administrative reasons please send Your ID for Egyptians and Passport copy for non-Egyptians.,

Workshop Chairman : Prof Mohmed Ahmed Gomaa
Mobile: 01001457161, Email: mamgomaa@gmail.com

ICDA-5

Following the last ISRP Council meeting in October 2023 regarding next ICDA-5 site. It was my pleasure as ISRP Vice President for Africa and Middle East to request from the President of Egyptian Atomic Energy Authority {EAEA} to host the 5th International conference of Dosimetry and its Applications. It is my pleasure to inform members of ISRP Council that his Excellency agreed to host the conference provided to follow all Egyptian administrative procedures to host International Conferences. As soon as the administrate procedures is completed the first ICDA-5 circular shall be released.

I would like to thank President Prof. Lopes, all members of ISRP council for their support.

I am really delighted to congratulate Emeritus Professor Dudley Creagh On the award of Membership of the Order of Australia (AM).

NOTICE

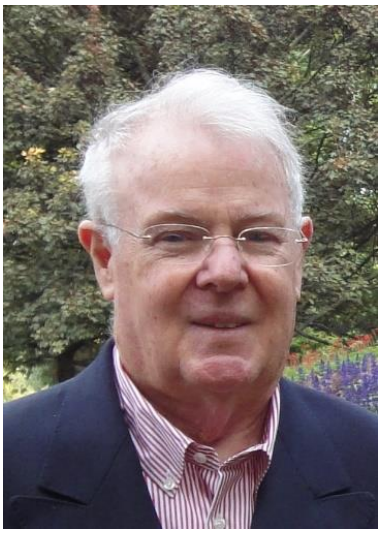
We are trying something new: which we hope will help bring our community closer together.

All over the world students are winning prizes for the excellence of their work, emerging researchers are having their research recognized in some way by their employers, some receive plaudits from professional societies.

We conceive of this as a way of bringing a better understanding of the work of our members. And a way of knowing them as people.

Member Profile

Dudley Creagh AM



I met Emeritus Professor Creagh 30 years ago, as a young research fellow commencing my career. He gave up his invited Plenary Lecture at a major conference for me, saying that my research results on X-ray scattering were more precise than his. We have maintained a happy and successful collaboration with one another ever since.

Professor Creagh has always been a statesman, both internationally and in Australia. In the 1980s, he led the development of the Australian National Beamline Facility (ANBF) at the Japanese synchrotron radiation facility, the Photon Factory, situated at Tsukuba. This was Australia's first essay into the field of synchrotron radiation science. The beamline at the Photon Factory was a versatile beamline which supported the research of many Australian scientists in such diverse fields as XRD, X-ray Reflectivity (XRR), Small Angle X-ray Scattering (SAXS), XAFS and XANES for more than 20 years. The Australian research output added substantially to the research output of the Japanese facility. I know the beamline well. After I returned to Australia in the 1990s, I became a frequent user of this facility, visiting it some 3 times per year for major experiments. After the Fukushima Earthquake, I led the team to repair the facility, successfully. I ran the last experiment there before its closure due to lack of Australian funding, and chaired the Closing Ceremony. The success of the beamline led ultimately to the creation of the Australian Synchrotron Research Project (ASRP), in which both Professor Creagh and I played significant roles. The success of the ASRP led to the establishment of the Australian Synchrotron..

Throughout his career Professor Creagh demonstrated to the world that Australia is able to make major contributions to Research and International Policy. His record as Chairman of the Commission for Crystallographic Apparatus of the International Radiation Physics Society [IUCr] (11 years), and as President and office bearer of the International Radiation Physics Society [IRPs] (28 years), is exemplary. As well, he still provides detailed expert references and editorial comments for journals, and makes major contributions to international reference works. As Past President of the IRPS and the longest-serving member and Chair of the IUCr Commission on XAFS, I can attest to the extent to which Professor Creagh's involvement has been influential in the field of X-ray scattering, and how his leadership has led to the creation of many successful scientific experimental initiatives.

At the University of Canberra, and the Australian Defence Force Academy, he led interdisciplinary research at a time when those words had little meaning.

He was a leader in the development of scientific techniques for the study of

artefacts of culture heritage significance. This relatively new field of research is important both national and international museums and galleries, and archaeology. To give a national example: fifty years ago the total number of conservators in Australian museums and galleries was less than fifteen, and the state of the artefacts held in their collections was a national scandal. Public outcry led to the establishment in 1977 of a Course on the Conservation of Cultural Materials at what is now the University of Canberra. The first such course in the world. Forty years later there are more than 1000 practicing conservators in Australia. At the 50th Anniversary of the Australian Institute for the Conservation of Cultural materials (AICCM) Professor Creagh delivered an address on the diverse range of artefacts he had studied in the past 40 years, and the new techniques he developed to examine them. Two examples he referred to were studies of Australian Indigenous art and artefacts, and the Dirk Hartogh plate, a Dutch National Treasure.

For fifteen years Professor Creagh was scientific advisor to the Australian Customs Service, guiding the acquisition and performance testing of equipment used in the protection of Australia's Sovereign Borders. Everyone who has passed through an airport will be aware of some of these devices. Professor Creagh has developed a number of new systems for the evaluation of the performance of Border Protection equipment. Most of the equipment used in Border Protection operate over a wide range of photon energies (THz, mmW, NIR, IR, X-ray). Each technique requires its own specialized set of standards so that operational integrity of the overall Border Protection program can be maintained.

Professor Creagh has designed scientific equipment throughout his career. Amongst his many major executed designs are the beamline and X-ray diffractometer (the latter with Stephen Wilkins) at the Photon Factory, an X-ray Reflectometer at the ANU, and the Infrared and Terahertz spectroscopy beamlines at the Australian Synchrotron.

Professor Creagh has been an office bearer in several national societies: the Australian Institute of Physics (AIP), the Society of Crystallography in Australia (SCA), the Australian X-ray Analytical Association (AXAA) and the Asian Crystallographic Association (AsCA) .

Emeritus Professor Creagh has recently been honoured for his contributions to science and to tertiary education by being made a Member of the Order of Australia (AM).

At 89 years of age. he continues to provide advice, guidance and leadership to students and staff of his own, and other institutions.

With my very best wishes, Dudley, and congratulations on your award.

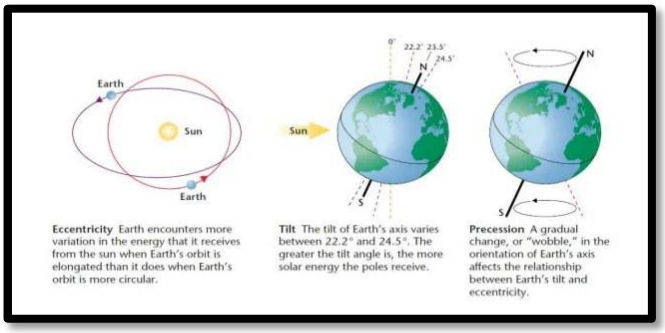
Professor Chris Chantler **University of Melbourne**

News from around the world

In recent conversations with secondary school students on physics in general I found that, whilst many were excited by the daily releases of photographs from the James Webb Telescope, usually with the captions like "*we have discovered structures which challenge modern physics*", the same students had little knowledge about our sun, and its effect on our daily lives. I have written a little on this topic in previous editions of the IRPS Bulletin.

Whilst most students knew that the earth moved around the sun in an elliptical orbit no one knew that other factors perturbed the elliptical orbit, namely:

the eccentricity of the orbit, the tilt of the earth's rotational axis, and the precession of its axis. These factors which collectively influence the solar irradiance as a function of latitude are referred to as the Milankovich effect.



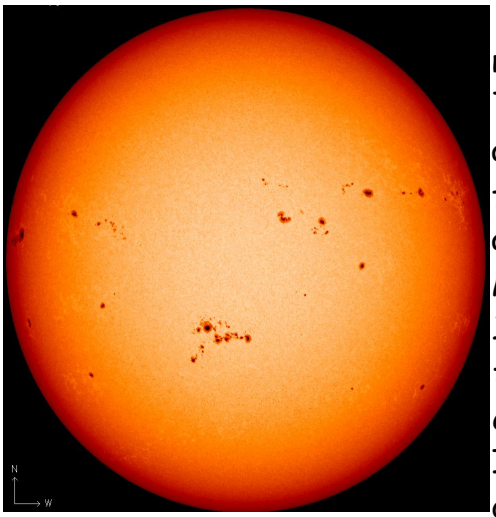
The theory explains the periods of major climate change over the past 450,00 years, including the Great (2.6M to12000 BCE), and Little (1450-1850) Ice Ages . A review of studies on this topic was published in 2016 [MA Maslin 2016 (Nature 540(7632):208-210)].

But solar irradiance is not constant. In the first instance, Th sun is a plasma, constrained on one hand by gravitational forces, and driven by the nuclear fusion reactions which are occurring. [4 $_1H_1$+ 2e- → $_4He_2$ + 2ν_e + 26.73MeV]. There are a number of steps in this simplification of the fusion process. (Bulletin 2022 Vol 35 No 1 p15). Another fusion reaction exits, the CNO cycle This cycle comprises a set of reactions in which four 3 $_1H$ nuclei ultimately combine to form $_4He_2$ with carbon, nitrogen, and oxygen as catalysts and intermediate products [Bethe, H 1939 Phys Rev **55**(5) 434-450]. In the long term the solar hydrogen will be consumed, and our star will die.

The maelstrom of highly energetic charged particles generates strong electromagnetic fields. These electromagnetic fields are about 2,500 times than the terrestrial magnetic field. These strong fields create forces which counteract the electrical and gravitational forces, causing regions which are cooler than neighbouring parts of the photosphere.

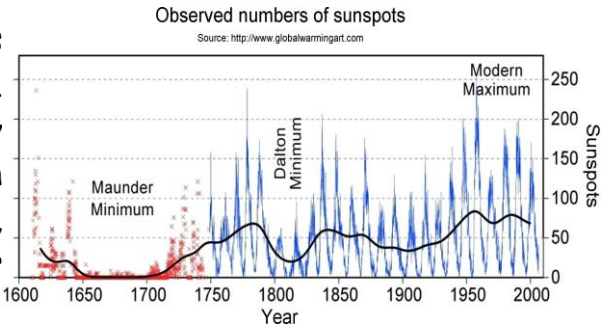
The flow of gas towards the surface of the sun, lowers the temperature and therefore the radiation emitted from the affected area.

The effect of this is that an observer on the earth observes dark spots on the surface of the sun. These are referred to as **sunspots**. Atypical sunspot has a diameter comparable to the size of the earth. Sunspots were first observed in 300BCE by Chinese and Korean astronomers. Galileo and other astronomers observed sunspots much later, in the early 17th century. Data of sunspot numbers has been kept since by solar astronomers since 1645.



Sunspots increase and decrease in number with a periodicity of about 11 earth years. The graph below shows a plot of sunspot number as a function of time, commencing at 1600 and finishing in 2020. The solid line is the cumulative average of sunspots observed. The Maunder Minimum corresponds to the period of the *Little Ice Age, the occurrence of which is denied by the IPPC on the grounds that the whole surface of the earth was not covered by ice.* The Little Ice Age (1600 to 1930) caused mass migrations of populations: the Norse left their home in Greenland, which they had settled in 1000 CE, for example.

Another solar phenomenon of significance is the cyclical reversal of the of its magnetic poles. This occurs every 11 years. The last reversal occurred at the midpoint of Solar Cycle 24 (2014) when the sunspot number was 81,8. (US National Oceonographic Atmospheric Organization).



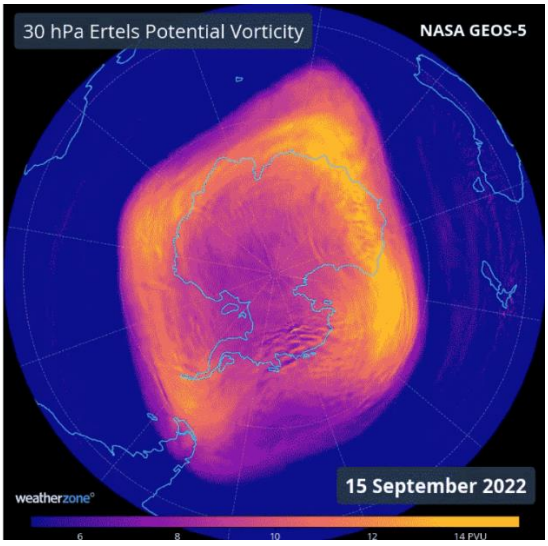
Meteorologists have differing views about the effect of sun- spots on weather. They admit that solar activity does vary with the sunspot cycle, but they then go on to say that, on a millennial scale, earthquakes, tectonic plate shifts, polar magnetic field shifts, and other terrestrial phenomena have no influence on climate. None of the climate modelling done to date has taken these factors into account, for one good reason: it is only recently that reliable geophysical measurements have become available. And the effects of ocean vents between tectonic plates, subduction of tectonic plates, and the influence of the effects of the eruption of submerged volcanos have yet to be assessed.

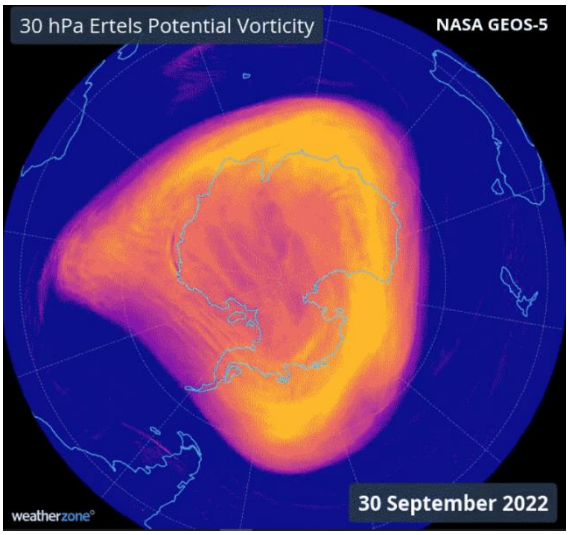
Totally ignored is the Southern Annular Mode index (and its North Polar counterpart (NAM)). (Y Kuroda JGR Atmospheres 2018 **123** 4 pp 1959-1969).

Kuroda's conclusions are shown below,

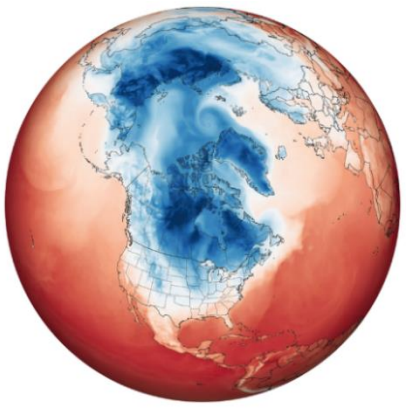
> The Southern Annular Mode (SAM) is the dominant hemisphere-scale mode of variability in the Southern Hemisphere. Analysis of the European Centre for Medium-range Weather Forecasts Reanalysis data set (ERA-Interim) for 1979–2015 shows that stratospheric variability associated with the October–November mean SAM index is modulated in synchrony with solar activity. The sequence of stratospheric variability after July, similar to that associated with the Polar-night Jet Oscillation in the Southern Hemisphere, is well connected to the SAM during years of stronger solar activity, but the connection is weak during years of weaker solar activity. The source of this solar cycle

The stratospheric disturbance caused by the sun's activity has the effect of shifting the latitude at which the dominant circular airflows northwards or southwards, bringing cool airflows northwards or southwards in synchronism with solar activity, Images of the Antarctic Vortex taken on two days by the NASA GEPS-5 satellite are shown in the pictures below.





The Antarctic Polar Vortex is a stratospheric wind pattern which blows strongly around the Antarctic coast and is driven by the temperature difference between the cold of the pole and the warmth of the lower latitudes. Its shape is consistent.



By contrast, the Northern Polar Vortex has no land mass to "pin" the vortex. There are big mountain ranges at latitudes which can disrupt the stratospheric airflows (the Urals, the Rockies, the Scandes, the Greenland Plateau). These can cause severe weather events at ground level. The NASA satellite image shows a disruption event in which the vortex is directed down through Canada and the USA, causing surface temperatures of -40° C in places like Chicago.

What caused the disruptive event has yet to be ascertained.

Returning to the effect of sunspots on weather: the sunspot cycle is not included in the predictive modelling used by meteorologists. So, there is little wonder why, for example, they predicted a strong El Nino event would occur in Australia beginning in 2023. El Nino events correspond to times of drought, and severe drought conditions were predicted.

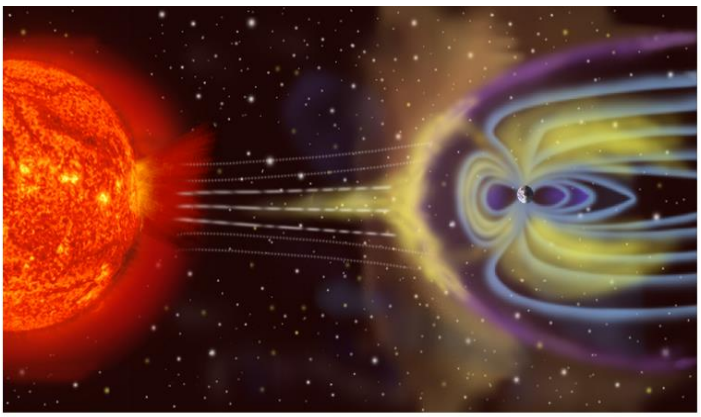
However, climate records show that in the past 150 years Australia has experienced a drought about every 11 to 14 years. Because the last drought ended in 2017 the next severe drought might be expected to occur in 2028. As well, we are near the sunspot maximum (2025), which correlates with increased rainfall. We have experienced floods in parts of the country in the past two years,

Clearly, something is missing from the models used by meteorologists.

So far, I have discussed only the cyclical effects of the sun on climate/weather. The sun, however the sun is far from predictable and is prone to sudden outbursts of radiation: **solar flares and coronal mass ejections**.

These occur usually between sunspots of opposite magnetic polarity. They are accompanied by the emission of charged particles with very high energies and are directed by those magnetic fields normal to the solar photosphere.

The arrival of these particles in the vicinity of the photosphere is followed, and their interaction with the earth's magnetosphere diverts the charged particles, for the most part away from the earth. The rest passes into the atmosphere where interaction with the ionosphere occurs. An artist's depiction of this interaction is shown on the left. (F Mottez Report CNRS 17 March 2019).



The magnetosphere is the interface between the interplanetary environment and the upper Earth's atmosphere. It is a vast region evolving under the control of the Earth's magnetic field. The magnetosphere is filled with a collision-free plasma, continuously out of thermodynamic equilibrium, turbulent, unstable, which undergoes almost daily global reconfigurations. The magnetosphere has only one visual manifestation, but of great aesthetic quality: the polar aurora.

Visible evidence of this penetration is shown on the Cover Page of this issue; the Aurora Borealis.

The interaction of the particles with the atmosphere causes distortion of the ionosphere with subsequent disturbance in telecommunications, causing damage to satellites, overload of terrestrial radio links, and cause outages in power transmission networks.

Recently two powerful solar flares erupted from the Sun: the first, an X1.8-class flare, occurred on February 21, and the second, an X1.7-class flare, happened on February 22. These solar events originated from a region of the Sun known as Region 3590, which continues to exhibit strong magnetic complexity. Around the same time as these flares there were widespread cellular phone outages across the United States of America. Major carriers like AT&T, Verizon, and T-Mobile reported tens of thousands of outages.

There is, as well, an increase in the level of background radiation at ground level, but the consensus of scientists is that the effect is small since the duration for which the activity persists is only for a short time.

Some evidence exists that lower energy particles arising from the interaction of particles from the solar flare can cause charging of clouds and aerosols which could enhance rainfall. (H Svensmark *et al* Springer Scientific Reports **11** 19668 2021)

There are perhaps other reasons for the heating of oceans: the escape of magma into the ocean floor through fissures vents, and volcanic activity is much greater than geophysicists have imagined.

University of Toronto geoscientists have made a significant breakthrough in plate tectonics, discovering that the Pacific Plate is not as rigid as previously thought but is instead torn by large undersea faults. This challenges traditional views and suggests a more complex interaction between oceanic plates and the Earth's mantle. Credit: SciTechDaily.com

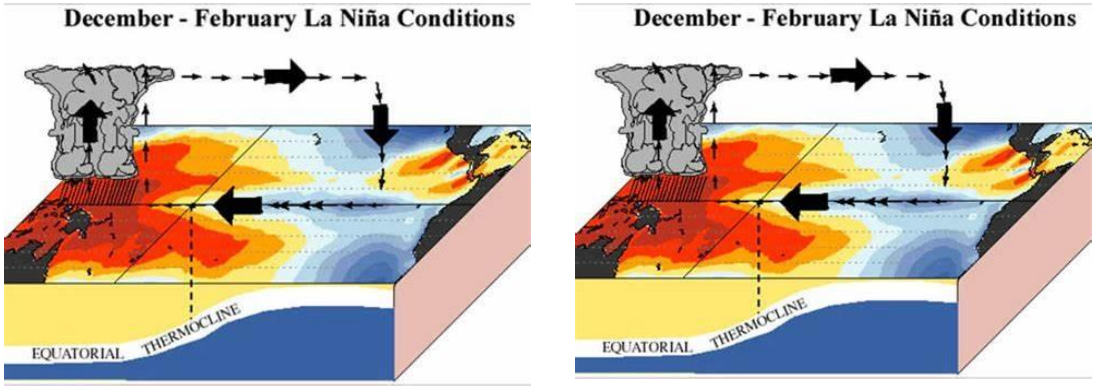
Research indicates that the Pacific Plate is being torn apart at undersea plateaus across the ocean, due to the weight of the oceanic plate subducting along the Western Pacific Ring of Fire.

(SciTechDaily 7 March 2024)

Just as I was writing article this the Australian Bureau of Meteorology released the following news release.

> In March 2024, the **Bureau of Meteorology** reported that there is an **89% chance** of a **La Niña** developing. La Niña refers to a prolonged period when cooler sea surface temperatures in the tropical Pacific Ocean lead to changes in global weather patterns. During La Niña, Australia typically experiences increased easterly winds and cloud development, resulting in above-average rainfall and cooler temperatures. The impact of La Niña depends on its duration, intensity, and interactions with other climate drivers. If it does occur this year, we can expect enhanced rainfall, particularly during spring,

This statement was followed with a description of the current models for predicting these events based on ocean temperatures. Which is fine. But nowhere do they say what actually causes the difference in the ocean temperatures.

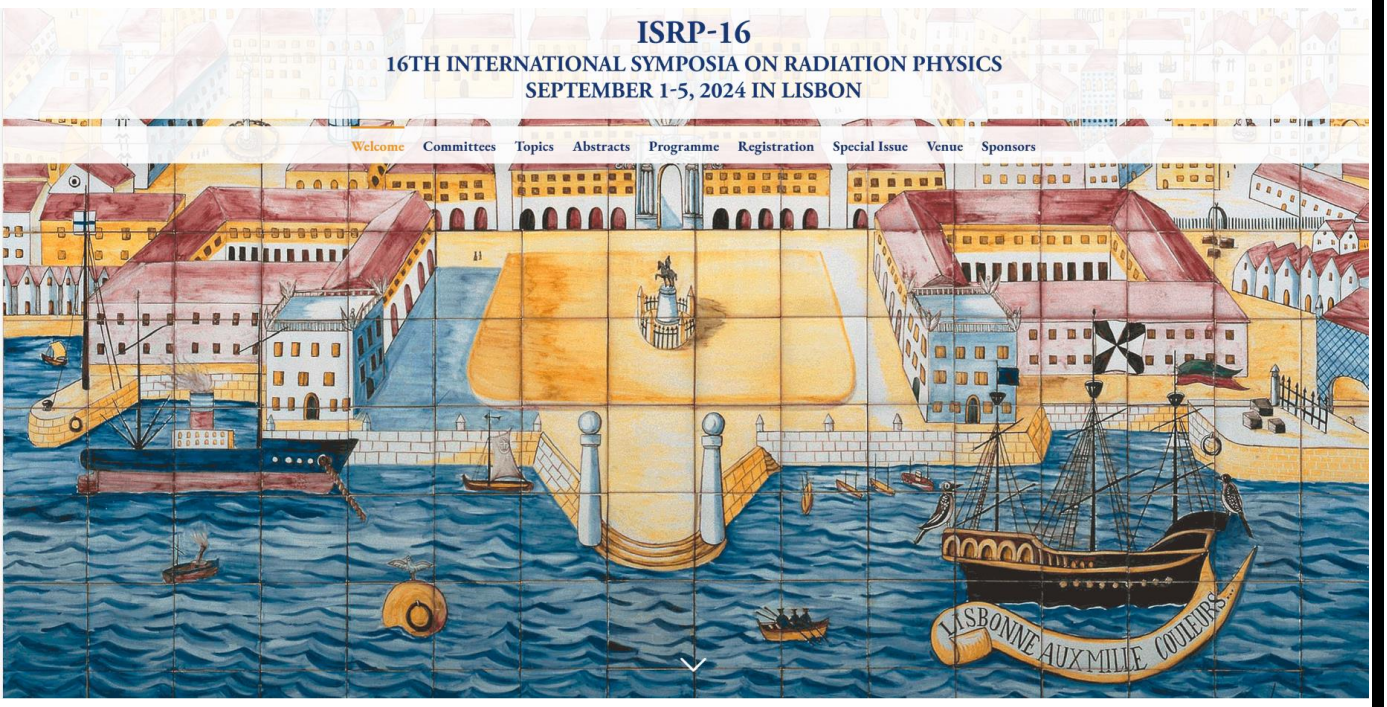


(News Release Australian BoM)

I have already mentioned a number of terrestrial and extra-terrestrial factors which may come into play: the effect of Volcanic eruptions, particularly those from submarine eruptions (the Tongan eruption of 2022 has disrupted air flows in the stratospheres close to the equator); bush fires and forest clearing (we need forests to convert CO_2 into O_2): and population growth (all animal life produces CO_2 — the world's population has grown from less than **2** Billion in 1900 to **8** Billion in 2024); and so on……..

Commentary by Dudley Creagh.

Up-Coming Conferences



The International Radiation Symposia are one of the regular activities of the International Radiation Physics Society (IRPS) founded in Ferrara (Italy) in 1985.

The ISRP-16 (September 1-5, 2024), 16th in the series of International Symposia on Radiation Physics, is being organized by the Laboratory for Instrumentation, Biomedical Engineering and Radiation Physics (LIBPhys) in Lisbon by NOVA SCHOOL of Science and Technology, the Faculty of Sciences and Technology-University of Coimbra, the Dentistry Faculty of the University of Lisbon and also the International Radiation Physics Society (IRPS). The meeting will be held at Dentistry Faculty of the University of Lisbon at the University City in the heart of Lisbon.

A Special issue on Radiation Physics and Chemistry Journal is devoted to ISRP 16th.For more details, please see https://isrp16lisbon.com/

IRPS Elections Information & Nomination Forms

Dear friends and colleagues,

It is that time of the triennial when we prepare for the elections of Councillors and our Board. This little invitation and document is to set the scene for the coming elections. Next issue will have the Election Slate for all members in good standing to vote on, with instructions etc. This issue asks those who would like to stand or continue whose terms are expiring to confidentially let the Nominations and Election Committee know. As I am the Chair, that means let me know. As the Slate will be prepared for the next Bulletin, and Elections will be announced for either 3 years or 6 years depending upon term, at ISRP in Lisbon, it is time to get skates on if you are interested and willing.

The positions to be filled are as follows
President [3 year term]
Regional Vice-Presidents [10 last election including one for IRMMA / Industrial Applications] [3 year term]
Executive Councillors [5 by at present, though 'normally' 4] [6 year term] [three are continuing from last time]
Secretary [3 year term]
Treasurer [3 year term]
Membership Officer [3 year term]

Other particular positions

Bulletin Editor[s]
WebMaster[s]

Feel free to confirm with me that you are willing to stand again, or that you believe someone should be invited to stand etc.

Very best wishes to all
Chris
Chairman of the Election Committee.

Nomination Form

Criteria for Nomination

The person nominated must be a financial member of the IRPS.
The candidate must provide a recent passport-size photograph, together with a short (<300 word resume describing their qualifications, their research interests and any other information they feel relevant}

Please insert the above-mentioned information in this space.

Send the information to:
Chris Chantler
Chairman of the Elections Committee
Chantler @ unimelb.edu.au

The deadline for inclusion of the candidates resume in the next issue of the Bulletin is 15 July 2024

Proposer (name & institution**)**
Candidate. (name & institution**) I agree for my nomination to the IRPS Council as…….)**

International Radiation Physics Society

The primary objective of the International Radiation Physics Society (IRPS) is to promote the global exchange and integration of scientific information pertaining to the interdisciplinary subject of radiation physics, including the promotion of (i) theoretical and experimental research in radiation physics, (ii) investigation of physical aspects of interactions of radiations with living systems, (iii) education in radiation physics, and (iv) utilization of radiations for peaceful purposes.

The Constitution of the IRPS defines Radiation Physics as "the branch of science which deals with the physical aspects of interactions of radiations (both electromagnetic and particulate) with matter." It thus differs in emphasis both from atomic and nuclear physics and from radiation biology and medicine, instead focusing on the radiations.

The International Radiation Physics Society (IRPS) was founded in 1985 in Ferrara, Italy at the 3rd International Symposium on Radiation Physics (ISRP-3, 1985), following Symposia in Calcutta, India (ISRP-1, 1974) and in Penang, Malaysia (ISRP-2, 1982). Further Symposia have been held in Sao Paulo, Brazil (ISRP-4, 1988), Dubrovnik, Croatia (ISRP-5, 1991) Rabat, Morocco (1SRP-6, 1994), Jaipur, India (ISRP-7, 1997), Prague, Czech Republic (ISRP-8, 2000), Cape Town, South Africa (ISRP-9, 2003), Coimbra, Portugal (ISRP-10, 2006), Australia (ISRP-11, 2009), Rio de Janeiro, Brazil (ISRP-12, 2012), Beijing, P.R.China (ISRP-13, 2015), and Córdoba, Argentina (ISRP-14, 2018), Malaysia (ISRP-15, 2021), *and next* Portugal (ISRP-16, 2024)

The **IRPS Bulletin** is published twice a year and sent to all IRPS members.

The IRPS Secretariat is: Prof. Thomas Trojek (IRPS Secretary),
Czech Technical University in Prague, Czech Republic
Email: tomas.trojek@fjfi.cvut.cz

The IRPS welcomes your participation in this "global radiation physics family**"**

The publication of the IRPS Bulletin and the maintenance of the IRPS website are facilitated by the generous assistance of the Sunway University, the University of Canberra, and the University of Melbourne.

Membership Registration Form

1. Name: ---------- (First) (Middle Initial) (Last)

2. Date and Place of Birth: ----------

3. Business Address: ---------- (Post Code) (Country)

Telephone: ---------- Email: ---------- Fax: ----------

4. Current Title or Academic Rank (Please also indicate if Mr., Miss, Mrs., or Ms.): _____

5. Field(s) of interest in Radiation Physics (Please attach a list of your publications, if any, in the field)

6. Please list any national or international organization(s) involved in one or more branches of Radiation Physics, of which you are a member, also your status (e.g., student member, member, fellow, emeritus):

7. The IRPS has no entrance fee requirement, only triennial (3-year) membership dues. In view of the IRPS unusually low-cost dues, the one-year dues option has been eliminated (by Council action October 1996), commencing January 1, 1997. Also, dues periods will henceforth be by calendar years, to allow annual dues notices. For new members joining prior to July 1 in a given year, their memberships will be considered to be effective January 1 of that year, otherwise January 1 of the following year. For current members, their dues anniversary dates have been similarly shifted to January 1.

Membership Dues (stated in US dollars - circle equivalent amount sent)

Full Voting Member: 3 years	**Student Member: 3 years**
Developed country $75.00	Developed country $30.00
Developing country $25.00	Developing country $10.00

Acceptable modes of IRPS membership dues payment, to start or to continue IRPS membership, are listed below. Please check payment-mode used, enter amount (in currency- type used), and follow instructions in item 8 below. (For currency conversion, please consult newspaper financial pages, at the time of payment).

All cheques should be made payable to : **International Radiation Physics Society**.
For payments via credit card (preferred):
https://www.ph.unimelb.edu.au/~chantler/opticshome/irps/registrationirps.html

8. Send this Membership Registration Form AND a copy of your bank transfer receipt (or copy of your cheque) to the Membership Coordinator:

Dr Eric L. Shirley
Sensor Science Division National Institute of Standards and Technology
100 Bureau Drive MS 8441 Gaithersburg, Maryland 20899-8441, USA
email (preferred): eric.shirley@nist.gov

9. Sign
