

THE FLUX LINE

2025 YEAR-IN-REVIEW

News of the Geomagnetism, Paleomagnetism and
Electromagnetism Section of AGU

Message from the President

This is the 2025 Year-in-Review Fluxline Newsletter of the Geomagnetism, Paleomagnetism, and Electromagnetism Section. After spending two years as president elect, 2025 marked my first full year as GPE president. As president-elect I was proud to help Suzanne McEnroe create the GPE Tateshi Nagata early career award, which now has its second recipient, and open the GPE William Gilbert Award, now in its 23rd year, to all career stages. The GPE Section has no shortage of talented and deserving members, and so relieving the pressure on the Gilbert Award, which used to alternate between early career and senior awardees, is a welcome change. Keep those nominations coming!

Apart from shepherding the business of the GPE Section, the president and president-elect sit on AGU Council and help in the governance of the entire organization. This has been a somewhat tumultuous time for AGU. Council has agitated, successfully, for a more meaningful role in AGU governance, just in time to assist in the pushback on the numerous and severe attacks on science, and climate science in particular, that our community is facing. I am really proud of the work that AGU has done in this regard, initiating and participating in lawsuits, collating the experiences of individual members, facilitating calls and emails to congress members, and maintaining an active presence in the offices of lawmakers. But damage has been done and my heart goes out to those, often young, Earth scientists who have lost their jobs or despair of being able to support an academic career. We must persevere!

My apologies for the late release of this annual newsletter – it is entirely my fault.

Steven Constable, GPE president 2025/26.

GPE 2025 Highlights from AGU25

The AGU25 meeting returned to New Orleans and was branded “Where Science Connects Us”. 1 geoburst, 7 oral, and 8 poster sessions were led by GPE. Attendance was down

over previous years, and we particularly missed many of our European colleagues, but there was a critical mass and those who were able to attend seemed to have a good meeting.

For the past two years GPE has presented its awards and held its business meeting as part of the Bullard Lecture, which has worked well. In the past, awards were presented at the GPE reception, which can be a noisy and boisterous event, and this year there was an all-AGU reception, which was less noisy and boisterous but also not so well attended. Hopefully the section receptions will return, but the plan is to continue to present the awards at the Bullard.

The **2025 Edward Bullard Lecture** was presented by **Paul Bedrosian** of the United States Geological Survey. The Bullard Lecture is presented by a scientist who has made significant contributions in the field of Geomagnetism, Paleomagnetism, or Electromagnetism, and is named to honor the work and life of geophysicist Sir Edward Bullard, commonly known as Teddy. It is part of the Bowie Lecture series, inaugurated in 1989 to commemorate the 50th presentation of the William Bowie Medal, AGU's highest honor and named for its first president.

Paul Bedrosian is a geophysicist interested in Earth processes, framework tectonics, natural hazards, and resource assessment through the lens of electromagnetic methods. He has investigated seismic variability along the San Andreas Fault, the tectonic assembly of North America, and the importance of inherited structure on magma storage and ascent. His current research includes regional-scale mineral-resource investigations, the magmatic/hydrothermal systems of active volcanoes, and the importance of solid-earth conductivity to space-weather hazards. The title of Paul's talk was appropriately nautical, given that Teddy Bullard spent time at Scripps Institution of Oceanography developing oceanic heat flow probes, and was **Plumbing the depths: Electromagnetic imaging of active volcanic systems**.

The GPE **William Gilbert Award** was given to Ramon Egli, Department of Geophysics and Conrad Observatory, GeoSphere, Austria. The William Gilbert Award is given annually in recognition of outstanding and unselfish work in rock magnetism, geomagnetism, paleomagnetism, electromagnetism, or related subjects. The William Gilbert Award is now open to all career stages. Ramon is a skilled theorist and experimentalist known for fusing fundamental math and physics to solve complex problems related to rock magnetism. Congratulations Ramon!



Image: Paul Bedrosian on the right with GPE President Steven Constable

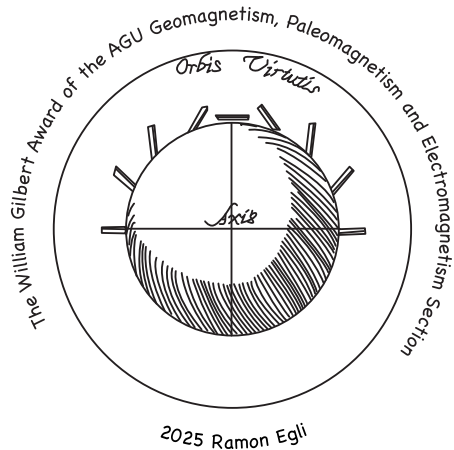


Image: Ramon Egli on the right with GPE President Steven Constable, and the Gilbert Award art work.

The GPE **Takesi Nagata Early Career Award** was given to Wentao Huang of the Institute of Tibetan Plateau Research, Chinese Academy of Sciences. The Takesi Nagata Early Career Award is presented annually to an early career scientist who has excelled in research and service to the fields of geomagnetism, paleomagnetism, and electromagnetism. Wentao works across geochronology, thermochronology, stable isotope geochemistry, and geology to understand the timing of magnetizations, which is critical for proper interpretation of paleomagnetic data. Congratulations Wentao!

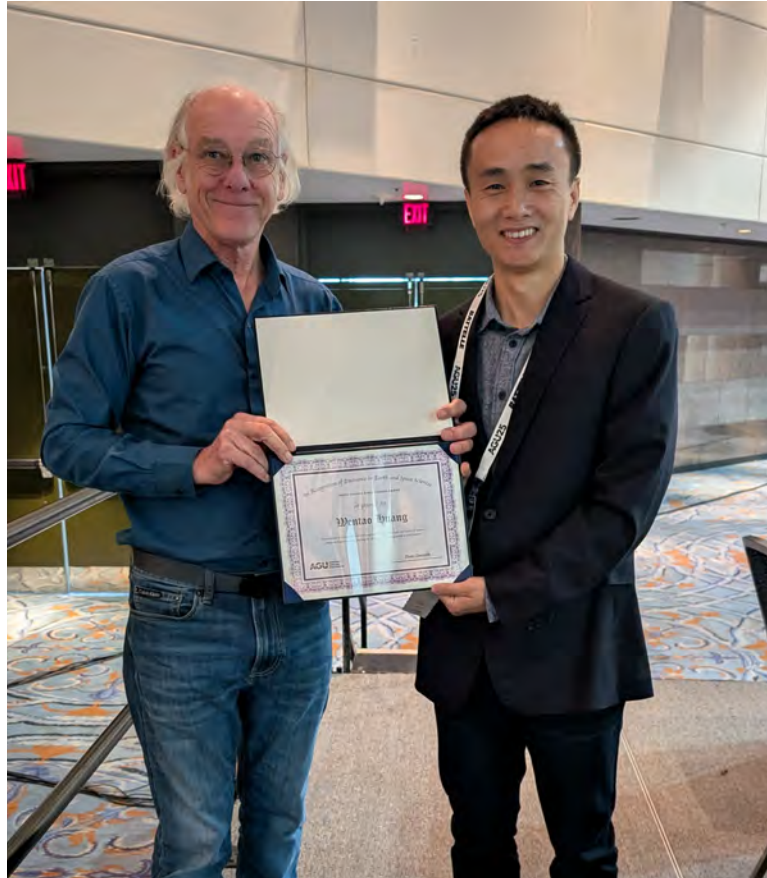


Image: Wentao on the right with GPE President Steven Constable

We also recognized and congratulated **other GPE awardees:**

Wout Krigsman, who was elected 2025 AGU Fellow,

Roger Fu, who was awarded a 2025 Macelwaine Award,

Rich Gordon, given the 2025 Bucher Medal.

We noted the **2024 Student Presentation Awards**,

Shaoting Feng, for The Electrical Structures Revealed by Magnetotelluric Data Near the Littoral Fault Zone of South China Sea.

Nastaran Ahanin, for Unveiling the Ordovician Superchron and Paleogeography of the Baltica Paleocontinent: New Insights from Paleomagnetic Data from Central Sweden,

Katie Bristol, for Assessing Eruptive Hiatus Durations of the Deccan Traps Large Igneous Province Using Quantitative Paleosecular Variation Analysis. GPE 2025 postdoctoral travel grants were given to Garima Shukla, Indian Institute of Geomagnetism, and Christina Vernhagen, Montclair State University.

2025 GPE Postdoctoral Travel Grant recipients were

Garima Shukla, Indian Institute of Geomagnetism, Tectono-Magmatic Controls on Polarity Reversals in the Narmada—Satpura—Tapi Dyke Swarms of the Deccan Traps

Christina Vernhagen, Montclair State University, Evidence of iron mineralization in the cap rocks of the Atlantis Massif, recovered during Expedition 357

The GPE Student and Early Career Reception

The GPE Student and Early Career reception was well attended this year. The evening provided a wonderful opportunity for networking and relaxing. Everyone enjoyed the evening. Plenty of food and drinks were available. We thank our early career representative, Courtney Wagner, and our student representative, Laurie Zielinski, for organizing this event. Funding for the event is provided by AGU and through our member donations to the GPE section.

Give to GPE

The GPE Post-doc Grants and early career events are made possible by the generous sponsorship of Applied Physics (formally 2G Enterprises), AGICO, and GPE member donations. I would like to extend a heartfelt thanks to all of our sponsors.

The AGU Section Incentive Program provides unrestricted funding to sections based on the number of qualified individual donations of \$50 or more (per individual) to any AGU fund by the group's primarily affiliated members. Many years more than 5% of GPE members donate, unlocking the matching contribution from AGU, but recently we haven't reached that threshold. Let's change that: make a gift and support the GPE section today!

2025-2026 GPE Committees

Executive Committee: Suzanne A. McEnroe (Past President) Steven Constable (President) Julie Bowles (President-elect) Maggie Avery (Secretary) Ankit Barik (Social Media and Web Editor) Courtney Wagner (Early Career Rep.) Laurie Zielinski (Student Rep.)

Fellows and Awards Committee: Julie Bowles (chair), Ken Kodama, Gary Egbert.

Annual Meeting Program Committee: Maggie Avery.

Canvassing Committee: Suzanne McEnroe, Steven Constable, France Lagoix.

If there are issues you would like to put forward to the GPE committee, or council please send a message to Steve Constable

In Memoriam

The GPE section sends its most sincere condolences to all of the families, friends, and colleagues that have lost loved, respected, and admired ones in 2025.



Dr. Michael David Fuller passed on July 14. Mike was a pioneering paleomagnetist whose work transformed our understanding of the Earth's magnetic field and lunar magnetism, passed away in July 2025. For over 60 years, the work conducted by Mike and his students defined and deepened the fields of rock magnetism and planetary magnetism.

After earning his PhD at Cambridge University in 1961, Mike worked at Gulf Oil Research Laboratory, after which he joined Professors Takesi Nagata and Kazuo Kobayashi at the University of Pittsburgh, and eventually led the paleomagnetic laboratory there. Mike subsequently held faculty and academic appointments at the University of California, Santa Barbara, and the University of Hawai'i at Manoa. Under Mike's leadership and mentorship, his labs were hubs of innovation that attracted a new generation of geophysicists including Bill Lowrie, Peter Wasilewski, Stanley Cisowski, Susan Halgedahl, and many others.

Mike's scientific legacy is immense, and includes the first evidence for ancient magnetic fields recorded by Apollo lunar mission samples, demonstrating how shock remanent magnetization could be acquired in planetary crusts, producing some of the earliest records of geomagnetic field reversals, developing methods to estimate magnetic grain

sizes through the acquisition and demagnetization of laboratory-induced remanences and through hysteresis measurements, developing room-temperature parameters to estimate the paleointensity of ancient magnetic fields preserved in samples far too precious to subject to heating, and using Bitter pattern observations of titanomagnetites to suggest that metastable single domain states could be the source of PSD behavior and stable TRM in titanomagnetites.

While on a sabbatical in Zrich in the 1990s, Mike initiated pioneering investigations of the presence of magnetic nanoparticles in the human brain. Subsequently his co-investigator, Jon Dobson, extended these studies to biomedical applications of magnetic micro- and nanoparticles, developing new techniques for studying neurodegenerative diseases such as Alzheimer's and Parkinson's.

Mike collaborated with Bill Goree in the development of SQUID magnetometers for the analysis of geologic and biological specimens. He was the first to use a SQUID in pass-through mode in order to generate records of paleosecular variation and geomagnetic field reversals from sediment cores. Each of these scientific and technical advances remains foundational in modern paleomagnetism and rock magnetism.

Mike's contributions to the paleomagnetism community were recognized by election as a Fellow of the American Geophysical Union in 1985 and with the John Adam Fleming Medal in 2012. Mike will be remembered not only as a founder and driving force of paleomagnetism but as a joyful person and role model for unselfish collaboration. Mike is survived by his daughter, Karen Fuller, and her son Shawn Fuller. (Stefanie Brachfeld, Michael O. Garcia, William Lowrie)



Prof. Antal Ádám (“Toni Adam”) passed away on March 15, 2025, at the age of 95. Antal Ádám was a unique and celebrated figure in the international magnetotelluric community. He introduced the magnetotelluric research method to Finland and Austria, and promoted the application of electromagnetic induction methods in India. He was a pioneer and successful instrument developer in telluric current research and a researcher of the electrical anomalies of the lithosphere of the Pannonian Basin. Using simultaneous field observations carried out in China and Hungary with Erno Takács, he demonstrated even in 1955 that the geomagnetic pulsations are of enormous extent.

Antal Ádám obtained his technical university doctorate in Miskolc (1962) and defended his academic doctoral dissertation in 1969. He was a founding member of what is today's HUN-REN Institute of Earth Physics and Space Science, deputy director of the Sopron research institute (1972 – 1999), and research professor of the institute until his retirement (2005).

Awards include membership of the Hungarian Academy of Sciences (1993), Széchenyi Prize winner (1996), two-time Academy Prize winner (1962 and 1970), titular university professor at Eötvös Loránd University (1974), the Eötvös Loránd Memorial Medal (1980), member of the Royal Astronomical Society (1985), honorary doctor of the University of Oulu (1989), corresponding member of the Austrian Academy of Sciences (1995), honorary doctor of the University of Miskolc (2004), holder of the Ipolyi Arnold Science Development Award of the Hungarian Research Fund (OTKA, 2005), regular member of the Szent István Academy (2006), and an Honorary Citizen of the City of Sopron with County Rights (2007).

His abundant service included editor-in-chief of a monograph summarizing the planetary geophysical knowledge of the that time socialist countries (Geophysical and Geothermal Studies, 1976), founding member of the Association of Hungarian Geophysicists (MGE, 1954), chairman of the Geophysical Scientific Committee of the Hungarian Academy of Sciences (1973—1976), the Hungarian national committee of the International Lithosphere Program, chair of the electromagnetic induction working group (IAGA WG I.2, now Division VI) (1979 — 1983), co-chairman of the internal magnetic field division of IAGA, chairman of the magnetotelluric working group of the planetary geophysical organization of the Comecon countries (KAPG), and vice-chairman of the Veszprém Academic Committee of the Hungarian Academy of Sciences (1990 — 2002).

Antal Ádám was one of those great individuals whose quantitative geoscience oeuvre has still shaped the research approach of the HUN-REN Institute of Earth Physics and Space Science. (László Szarkar)



Jean-Louis Le Mouél of the Institut de physique du globe de Paris (IPGP), passed away on 24 September 2025. Born on 29 July 1938 in Remungol (Morbihan), he completed his secondary education in 1955 at Pontivy High School, studied for a degree in mathematics at the University of Rennes (1958), then moved to Paris where he took courses for a postgraduate diploma in Earth Physics at the Paris Faculty of Sciences (1959) and prepared a postgraduate thesis at the IPGP on thermoelastic stresses at the ocean-continent boundary (1961).

During his doctoral thesis, he quickly became interested in terrestrial magnetism and in 1969 he published a new magnetic map of France with Émile Le Borgne. Faithful throughout his career to the IPGP, which he directed from 1986 to 1996, he played a major role in developing a modern approach to geomagnetism, promoting the emergence of rapidly expanding disciplines, and encouraging the development of space activities and global networks of observatories in geomagnetism, volcanology and seismology. He also trained a large number of researchers who are now active in France and around the world.

Jean-Louis Le Mouél's scientific contributions are extremely numerous (nearly 300 publications) and wide-ranging. He is one of the pioneers of modern interpretation of magnetic observations. In the late 1970s, analyzing long series of observatory data with Vincent Courtillot and Jol Ducruix, he established that the main field produced by the geodynamo in Earth's liquid core is capable of rapid variations, producing in particular 'geomagnetic jerks' on a global scale. The short time required for these changes to occur at the Earth's surface provides valuable constraints on the electrical conductivity of Earth's mantle, which he went on to study with José Achache and other students who followed in his footsteps. But above all, he understood the importance of linking observations and theoretical approaches to fully interpret the evolution of the contemporary Earth's magnetic field. In 1984, in a paper that remains famous, he established the so-called 'tangentially geostrophic' hypothesis, which laid the foundations for interpreting the observed secular variation in terms of movements at the surface of the core. The work he then carried out with his students, benefiting from collaborations with numerous foreign visitors such as Ted Madden, Georges Backus and Stanislav Braginsky, enabled him to link these movements to variations in the length of the day, understand the couplings between the core and the mantle, and pave the way for numerical simulation of the Earth's dynamo.

Although geomagnetism was Jean-Louis Le Mouél's main field of research, his contributions in other areas were numerous. From the late 1970s onwards, together with Jacques

Zlotnicki, he became interested in the electromagnetic signals produced by volcanoes. A little later, with Pierre Morat, he became interested in the electrical signals produced by stresses on rocks, which then led him more broadly to the geophysical study of underground cavities in collaboration with Frédéric Perrier. Together with Claude Allègre he helped introduce non-linear physics into geosciences. Their 1982 study on scaling laws in rock fracturing contributed to the emergence of an entire discipline aiming at describing earthquakes as a self-organised critical phenomenon, sparking renewed interest in the analysis of earthquake size distribution (Gutenberg-Richter law). With Jean-Paul Poirier and their students, he also conducted work on the nature of the core-mantle boundary and published two landmark articles in 1997 and 2001 on the cooling of the core and the age of the inner-core. Finally, with Fernand Lopes and Vincent Courtillot, and until very recently, he worked to identify and characterize the influence of the Sun on numerous geophysical parameters, a particularly delicate exercise if ever there was one.

Beyond his scientific work and his major role in the development of the IGP, he was one of the founders of the INTERMAGNET network of magnetic observatories and of the SEDI (Study of the Earth's Deep Interior committee, which he chaired) of the IUGG (International Union of Geodesy and Geophysics Internationale). He was the recipient of numerous national and international awards, including the CNRS Silver Medal (1985), Fellow and then Fleming Medal of the American Geophysical Union (1991 and 1997), Petrus Peregrinus Medal of the European Geosciences Union (2005), Shen Kuo Prize of the International Association of Geomagnetism and Aeronomy (2013). Jean-Louis Le Moul was a member of the French Academy of Sciences, the Bureau des Longitudes (President from 1997 to 1999), the Academia Europaea, the Geological Society of France (President in 1992) and the Société Philomathique de Paris. He was also an officer in the Order of the Legion of Honour, the National Order of Merit and the Order of Academic Palms. Jean-Louis Le Moul was, above all, an outstanding mentor who trained, encouraged and supported several generations of researchers, who are deeply grateful to him. (Gauthier Hulot, Dominique Jault, Mioara Manda and Clément Narteau, on behalf of all his former students and colleagues)



Michel Prévot passed away on 5 November 2025. A student of Émile Thellier, he devoted the first 20 years of his career to the historic paleomagnetism laboratory in Saint-Maur-des-Fossés, France, where he worked primarily on the physical properties of remanent magnetizations, mainly in lava flows. He developed strong connections with another historic laboratory, the USGS in Menlo Park, California, during a sabbatical stay in the early 1980s. In 1985, he moved to the south of France to establish the paleomagnetism laboratory in Montpellier. At Montpellier, Michel Prévot built one of the most advanced analytical platforms of its time, quickly acquiring a CTF cryogenic magnetometer and highly precise

Pyrox furnaces, thanks to the integration and development work carried out by his successive engineers, Daniel Rivire and Thierry Poidras. Those who spent time with him will remember his kindness and his remarkable patience in explaining and applying scientific concepts with great clarity. He consistently showed genuine care for his students and always took the time to ensure his audience could follow his reasoning. Whether at conferences, in the lab, or out in the field, he expressed himself with calm, thoughtful precision – never hurried, always measured – reflecting the quiet confidence he had in his work and in his ideas. His former students now fully appreciate how fortunate they were to have had him as a mentor. He retired in 2005 to devote himself fully to his family and grandchildren. A tribute to him was published in 2009 in a special issue of EPS37, where the highlights of his career were recounted in the preface. There is no doubt today that Michel's work has greatly benefited the paleomagnetism and rock magnetism communities. (Pierre Camps)



The university of Victoria is mourning the passing of professor emeritus **John T. Weaver**, who passed away peacefully, at the age of 92, on April 26, 2025. Our thoughts are with his wife Ludmilla, his three children, and eight grandchildren.

John was a longtime professor in the department of Physics and Astronomy and the School of Earth and Ocean Sciences until his retirement in 1998. He spent eight years as chair of the Physics and Astronomy Department, and five years as Dean of Science. He is remembered as a superb leader and voice of reason during discussions, kind, fair and supportive, and was respected and admired by his colleagues.

John was born in Birmingham, UK, and earned an honors degree in mathematics from Bristol University. He came to Canada to complete an MSc and PhD in physics at the University of Saskatchewan, and then moved to Victoria to work as a research scientist at the Pacific Naval Laboratory in Esquimalt. In 1966, he accepted a faculty position at UVic, where he spent the next 32 years.

John served as dean during a transformative time for the Faculty of Science. He helped to foster the growth and development of the new School of Earth and Ocean Sciences, the Centre for Earth and Ocean Research, and the VENUS and NEPTUNE cabled ocean observatories, and instituted a teaching awards program. He also led the division's transition from within the Faculty of Arts and Science to an independent Faculty of Science. John's energy, devotion and vision for expansion were critical in the success of these initiatives.

John was passionate about studying geophysics, in particular geomagnetism. He was effective in solving many problems in electromagnetic induction within Earth and made significant progress in all aspects on this topic. His research has had applications in exploration geophysics, seafloor exploration, and the detection of submarines. In 1994, he published a book on mathematical methods for geo-electromagnetic induction in the Earth intended for both newcomers and practicing researchers.

John remained an active part of the UVic community post-retirement. He continued his research for many years, actively supported individuals for scholarships and prizes, and was constantly acting as a coach for new faculty members. He was a longtime attendee of monthly lunches at Spinnakers Pub with fellow retired academics, and attended Friday evenings at the University Club up until his passing. (Alexandra, Anthony and Andrew Weaver)