SSA
Seismological
Society of America

2024: Supporting Members Worldwide

Seismological Society of America

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On the cover (clockwise): USGS Hawaiian Volcano Observatory field engineers installing seismometer on the Southwest Rift Zone of Kīlauea; Tamarah King, seismic hazard scientist, in trench at Jindabyne Fault in Australia; Paul Andrew Spudich Travel Grant Recipients Chunyang Ji and Ilma del Carmen Juarez-Garfias.

Images: USGS, M.Warren; Monica Davis/ Geoscience Australia; SSA

The Society's newest honorees highlighted at the start of this annual report have made significant contributions to our field and our community.

They have created tools that aid seismic research, strengthened the connection between earthquake scientists and earthquake engineers, and shed new light on the link between seismology and public safety.

We celebrate these outstanding individuals because their SSA colleagues made such thorough and thoughtful nominations.

As you'll see in these pages, supporting one another is what SSA does best. Throughout the past year, our volunteers shared career advice, led workshops, and edited and reviewed the more than 500 outstanding papers that were published in SSA's three journals.

Because SSA directs author and subscriber fees back to fund the full range of member programming, these papers did more than report the latest developments in seismology. Your publications also supported another successful year of Society activities, including in-person gatherings for networking and research sharing, online career development trainings and critically important advocacy efforts in Washington.

In 2024, our donors brought smiles to the faces of more grant recipients than ever before, including the first to travel and share their research with the aid of a Paul Andrew Spudich Travel Grant. We offer deep gratitude for their generosity on pages 10 and 11. These friends help us continue to expand and enhance the professional support that members enjoy at SSA. We invest in each other.

Heather DeShon at the Assembly of the Asian Seismological Commission in Belek, Antalya, Turkey, where SSA added 29 new student and early-career members and two new countries—Algeria and Oman—to our community roster.

"Supporting one another is what SSA does best."

Through ongoing surveys, the Society strives to gauge and meet the needs of our diverse community, now more than 2, 700 members strong in 89 countries. During the past year, the Society added new open-access options to our publishing program and expanded our global reach through partnerships with other seismological organizations.

Thank you for your participation in SSA activities, which fuels our scientific progress and strengthens our connections with one another across so many career stages, disciplines and geographic borders.

It's been an honor to serve as president of this vibrant and supportive community.

Heather DeShon
SSA President, 2024–2025

2025 Honors

SSA recognizes the following members for their outstanding contributions to our community and to the field of seismology, including research, mentoring and public service.

Charles Langston

HARRY FIELDING REID MEDALIST

SSA's highest honor, this medal recognizes outstanding contributions to seismology or earthquake engineering.

Charles Langston, professor emeritus at the Center for Earthquake Research and Information at the University of Memphis, is the recipient of the Society's 2025 Harry Fielding Reid Medal.

He is best known for his seminal research on receiver function methodology, developing methods of extracting and analyzing subtle signals from body waves that can be used to image the Earth's crust and upper mantle in unprecedented detail. Described in his series of key papers in the late 1970s and early 1980s, the powerful tool has become a pillar of observational seismology for researchers worldwide.

Langston's receiver function methodology underlies the multi-station imaging techniques used in large seismic deployments by EarthScope Consortium and other international organizations. Langston's techniques are increasingly used to study seismic data collected by single-station deployments from planetary missions such as Mars InSight.

His extensive and innovative work on receiver functions, body-waveform modeling to study shallow earthquakes and explosions, seismic gradiometry and ambient noise, presented in more than 165 research publications, has been influential across the discipline.

Langston "has advanced our ability to use seismic waveforms to extract valuable information required to advance our understanding of earth and earthquake processes," said one nominator. "His work on imaging the crust and upper mantle, exploring interplate and intraplate seismicity, large and small earthquake rupture and sequences and underground nuclear explosions continues to inform, stimulate and guide current seismological research."

Others singled out his intellectual curiosity and his leadership in expanding the frontiers of observational seismology, noting his ability to develop techniques and then select the data that demonstrate their possibilities while contributing exciting new findings on topics from the crustal-mantle boundary to the interplay between the Earth's crust and atmosphere.

Langston served as SSA president (1990), associate editor (1985–1988) and editor (1992–1995) of the *Bulletin of the Seismological Society of America*, associate editor of *Earthquake Notes* (now *SRL*) (1979–1990), and chair of the Executive Committee of the Eastern Section-SSA (2002–2009).

He became a Fellow of the American Geophysical Union in 2003 and was the Dunavant Professor at the College of Arts and Science at the University of Memphis (2008–2011). He received the Eastern Section's Jesuit Seismological Association Award in 2011.

Langston received his B.S. in geology from Case Western Reserve University (1972), and his M.S. (1974) and Ph.D. (1976) in geophysics from Caltech.

First awarded in 1975, this medal honors pioneering contributions like those of seismologist Harry Fielding Reid (1859-1944), who proposed the elastic-rebound theory.

Jeffrey Given

FRANK PRESS PUBLIC SERVICE AWARD RECIPIENT

This award honors outstanding contributions to the advancement of public safety or public information relating to seismology.

For his work in developing the complex seismic monitoring tools that were essential to building an operational Comprehensive Test Ban Treaty Organization (CTBTO), SSA honors Jeffrey Given with the 2025 Frank Press Public Service Award.

His "scientific and development work on nuclear monitoring spans an impressive breadth from fundamental seismology to the hands-on minutia of developing and supporting the operational system that owes to him countless contributions over a period of three decades," said one of Given's nominators from the SSA community.

As a graduate student at Caltech, Given worked with Hiroo Kanamori to develop methods to rapidly determine the source mechanism of large earthquakes using the newly available digital seismometer networks. Given's early work on earthquake and explosion source studies began a long career in applied seismology focusing on near-real-time data for monitoring purposes.

His interest in software development and his fluency in many computer languages led to his key roles in establishing and maintaining the International Data Center (IDC) for the CTBTO. For 30 years, he offered expertise and advice on the CTBTO's seismic waveform acquisition system, waveform detectors, surface wave processing, event detection and location moment tensor estimators.

Given led international IDC teams that implemented advances in seismology while also including newer hydroacoustic, infrasound and radionuclide technologies. Later in his career, Given worked to support U.S. national efforts to enhance both U.S. and CTBTO monitoring capabilities.

In their nominations, Given's colleagues noted his unusual combination of theoretical and applied seismological expertise, along with software and data management skills, that made him a valuable leader in creating transparent, reliable and ever-evolving nuclear monitoring. His low-key but impactful leadership skills, they added, have brought international respect to a process that has contributed substantially to the peace of the planet.

Given received his B.S. in geophysical engineering from Colorado School of Mines in 1974 and his Ph.D. in geophysics from Caltech in 1983.

Weiqiang Zhu

CHARLES F. RICHTER EARLY-CAREER AWARD RECIPIENT

This award honors early-career members' outstanding contributions to the SSA mission.

Weiqiang Zhu's contributions to AI-based approaches to earthquake monitoring, numerical modeling and inverse problems that have pushed the frontier of seismological research have inspired his selection as the 2025 Charles F. Richter Early-Career Awardee.

Zhu, an assistant professor at the University of California, Berkeley, was commended by his nominators for his "AI-centric approach to earthquake monitoring," describing it as "nothing short of groundbreaking." Colleagues pointed out that Zhu's "deep-learning models, such as PhaseNet, DeepDenoiser and GaMMA, have been instrumental in redefining seismic phase picking, denoising and phase association."

Zhu's innovative work in applying machine learning to a host of geophysical problems has contributed to breakthroughs, such as the reveal of a mantle sill complex related to magma transport beneath Hawai'i, in collaboration with Zachary Ross's group at Caltech. The paper by Zhu and Gregory Beroza introducing PhaseNet, a convolutional neural network to measure P and S-wave arrival times, is one of the most cited

papers published in *Geophysical Journal International* since its release in 2018.

Zhu has expanded the capabilities of inverse problem-solving in seismology with several colleagues. He developed numerical simulations with Stanford University researcher Eric Dunham's group to quantify a fault valving mechanism providing new insights into earthquake ruptures and sequences. Recently, Zhu has brought his innovative abilities to fiber optic seismology, developing PhaseNet-DAS, a neural network model designed for seismic phase picking using distributed acoustic sensing (DAS) data with Zhongwen Zhan's group at Caltech.

Several nominators noted Zhu's creativity and his abilities to identify, develop and implement new freely available algorithms that become useful within the seismological community. They expect that Zhu will lead efforts to bring together machine learning, cloud computing and seismic analysis in the near future.

Zhu received his B.S. (2013) and M.S. (2016) in geophysics from Peking University, and his Ph.D. in geophysics from Stanford University in 2021. He was awarded the Director's Postdoctoral Fellowship from Caltech Seismological Laboratory in 2021.

James Mori

DISTINGUISHED SERVICE TO SSA AWARD RECIPIENT

This award honors individuals for their outstanding service to SSA.

For his outstanding work in expanding the Society's international presence and in ensuring investment in its newest members, James Mori was selected to receive the 2025 Distinguished Service Award.

Mori's outstanding service to SSA includes several key leadership roles, including terms on the SSA Board (2013–2018) and as president in 2016, as well as longstanding service as a member of the SSA Investment Committee.

As SSA president, Mori brought new energy to the Society's international outreach, especially in his persistent support for a joint meeting with the Latin American and Caribbean Seismological Commission. The meeting, first planned for 2018 in Puerto Rico, was moved on short notice to Miami, Florida, after Hurricane Irma. The gathering was one of the best attended SSA Annual Meetings to date, thanks in large part to Mori's support.

His nomination letter pointed out that "Earthquake hazard is global in scope, and Jim has long advocated that we should be proactive and generous with outreach to other societies that are well-connected to their communities and research relevant to their countries."

Following in the footsteps of his colleague Caltech Professor Emeritus Hiroo Kanamori, Mori has supported the next generation of seismologists through his work as chair and devoted promoter of SSA's Kanamori Fund. The fund provides SSA Annual Meeting travel grants to international researchers and helps support networking and mentoring opportunities for student and early-career members.

Mori's service to SSA includes chairing the SSA Nominating Committee in 2018, helping to expand the regional and scientific diversity of the SSA Board and committees. He has also served on the SSA Government Relations Committee (2021) and the Meetings Committee (2022).

Mori, now retired, was a professor at the Disaster Prevention Research Institute at Kyoto University since 1999, with a focus on earthquake and volcano hazards. He worked as the USGS Southern California Regional Coordinator and Scientist-in-Charge at the USGS Pasadena office from 1992 to 1998.

→ Honor Outstanding Community Members
Nominate deserving colleagues for SSA's 2026 Honors. For details and deadlines, visit **seismosoc.org/awards**

Laurie Baise

WILLIAM B. JOYNER MEMORIAL LECTURER

Awarded by SSA and the Earthquake Engineering Research Institute, this lectureship honors William B. Joyner's career at the USGS and his commitment to continuing communication and education at the interface between research findings of earthquake science and the practical realities of earthquake engineering.

Laurie Baise, professor and chair of the department of civil and environmental engineering at Tufts University, is the 2025 William B. Joyner Memorial Lecturer.

Through her research, she has explored earthquake site response, liquefaction, site characterization, regional wave propagation, ground motion models and earthquake damage assessment. Her contributions at the interface of seismology and earthquake engineering include a new approach for predicting liquefaction extent after earthquakes, called geospatial liquefaction modeling. The approach has fundamentally advanced the mapping of liquefaction risk across broad geographical regions. Her work inspired an analogous model for landslides, and the two models are now integrated into the USGS's earthquake monitoring systems and by hazard modelers in the insurance industry. She is working on comparable geospatial models for site amplification for use in ground motion models and the U.S. National Seismic Hazard Map.

In her nomination and support for the Joyner Lectureship, Baise's colleagues noted her focus on the early adoption and development of new techniques at the interface of earthquake science and engineering, including machine learning methods and satellite imagery. Past Joyner Lecturers cited her leadership in urging researchers and engineers to consider more complex and realistic site response models.

Kenneth W. Campbell

BRUCE BOLT MEDALIST

This medal is awarded jointly by the Consortium of Strong Motion Observations Systems, EERI and SSA to recognize individuals worldwide whose accomplishments involve the promotion and use of strong-motion earthquake data and whose leadership in the transfer of scientific and engineering knowledge into practice or policy has led to improved seismic safety.

Kenneth W. Campbell of CoreLogic Inc. (retired) is the 2025 Bruce Bolt Medalist. He is recognized for his 50 years of research and practice-oriented contributions to earthquake hazard and risk characterization and his innovative and impactful use of earthquake ground motion data.

He has been a leader at professional organizations, including CoreLogic Inc. and EQE International/EQECAT, focused on seismic hazard and risk analysis used in the insurance industry. Campbell's career includes work for the USGS and consulting companies specializing in developing design ground motion for critical facilities and oil platforms.

He is well-known for his impactful studies in ground motion modeling, several of which were cited by his nominators. These groundbreaking papers include the 1981 *Bulletin of the Seismological Society of America* paper "Near-Source Attenuation of Peak Horizontal Acceleration," which introduced the concept of magnitude saturation of peak ground acceleration; and the 2003 *BSSA* paper "Prediction of Strong Ground Motion Using the Hybrid Empirical Method and Its Use in the Development of Ground-Motion (Attenuation) Relations in Eastern North America," which pioneered the concept of the "hybrid-empirical method" for developing ground motion models in regions with sparse ground-motion recordings.

2024: A Very Good Year

Together, SSA members helped make 2024 an outstanding year of progress in the mission that unites us across career stages, disciplines and geographic borders: advancing seismology worldwide.

The Society's latest networking and research-sharing opportunities, including the new Paul Andrew Spudich Travel Grant program, helped more members participate in important scientific conversations than ever before.

Our community connected online to receive career advice from SSA mentors and enjoy our expert-led trainings on important topics like supporting seismic policy on Capitol Hill and giving a great presentation.

Thanks to our more than 1,000 volunteer editors and reviewers, the Society's three journals provided hundreds more rigorously reviewed scientific papers to readers in search of the latest information in our field.

> **"Reviewing articles is a great way to influence the direction, quality and future of earthquake science research."**
>
> *—TSR Reviewer of the Year Clara Yoon*

Our Global Community

2,788 Members worldwide

42% Outside the U.S.

89 Representing Countries

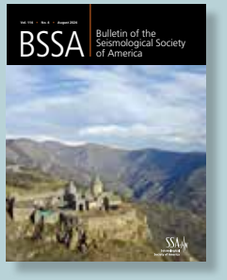
Our Meetings

97% Percentage of SSA 2024 attendees surveyed who described the last Annual Meeting (29 April–3 May 2024, Anchorage, Alaska) as a **valuable experience**.

20 William B. Joyner Memorial Lecturers, from Lloyd Cluff (2004) to Helen Crowley (2024), have strengthened the connection between earthquake science and engineering for two decades.

3rd SSA topical conference: Photonic Seismology: Lighting the Way Forward (7–10 October 2024, Vancouver, British Columbia) explored the past and the future of fiber-optic sensing, especially DAS, in seismology research.

Our Journals



3 Peer-reviewed journals (*BSSA*, *SRL* and *TSR*) shared excellent seismological research and offered new open-access options for authors.

65% Percentage of SSA's revenue, provided by author/subscriber fees, supported our meetings, grant programs, federal advocacy efforts, mentoring, trainings and workshops.

523 Scientific papers published with expert guidance from editorial volunteers, including 2024 Reviewers of the Year Rebecca Harrington, Susan Hough and Clara Yoon.

Our Grants, Sponsorships and Fellowships

47 SSA grants supported member networking and research sharing worldwide.

175 Scientific presentations at the SSA-sponsored 5th Regional Assembly of the Latin American and Caribbean Seismological Commission in San José, Costa Rica.

2 Student/early-career grant recipients were the first to share their science internationally with the support of SSA's new Paul Andrew Spudich Travel Fund.

5 Community Grants supported member learning opportunities, including the Seismology Student Workshop, the only student-focused and student-led seismology and tectonophysics workshop in the U.S.

24+ SSA visits to Capitol Hill advocated for continued federal support of key seismology programs, including an educational session led by Kyren Bogolub, Government Relations Policy Fellow.

Thank you for your support

SSA is grateful for the generosity of the following donors, who supported our mission in 2024.

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Aybige Akinci
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Charles Ammon
Douglas Anderson
John Anderson
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David Applegate
Walter Arabasz
Ralph Archuleta
Ramon Arrowsmith
Aysegul Askan
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Lian-Feng Zhao

→ Support the SSA Mission
As a small nonprofit, SSA relies on donations to support our members in their work to advance seismology worldwide. To make a tax-deductible gift to SSA, visit **seismosoc.org/give**

*Thank You for Rising to the Challenge

The SSA community came together to meet a year-end challenge goal for the Annual Meeting Travel Grant Fund. Thank you to the generous friends (marked with an asterisk in our donor list) who answered the call for help to fully fund another set of these seismology-advancing grants.

We are especially grateful to our lead donors, Peggy Hellweg, Heather DeShon, Thorne Lay, Fumiko Tajima, Bill Walter and Michael Fehler, who issued the challenge and offered to match every dollar with two!

Together, from November through December 2024, SSA community members raised a total of **$14,422** for this important fund, which helps promising scientists participate in the Annual Meeting.

“Participating in the SSA Annual Meeting—exchanging and discussing ideas—has always been one of my favorite parts of SSA. I give to the Annual Travel Grant Fund so that more of our young colleagues have the opportunity to join us and develop new contacts.”

—Peggy Hellweg, SSA past secretary (2016–22) and president (2022–23), who initiated the 2024 giving challenge

Together We Advance Seismology Worldwide

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