ISSMGE FOUNDATION
REPORT ON CONFERENCE ATTENDANCE

Your Name: *Sakshi Rohilla*	***Your Organization:*** *Indian Institute of Technology Kanpur*	***Date of report:*** 29th March 2026
Conference Title: *Geo-Congress 2026*	***Location of Conference:*** *Salt Lake City, Utah*	***Dates of Conference:*** *9th to 12th March 2026*

What you learned:

Participating in Geo-Congress 2026 in Salt Lake City, Utah, was a transformative experience that deepened my expertise in rock mechanics and dynamic soil behavior. Presenting my paper, "Evaluation of Flexure Modulus and Energy Dissipation in Intact Rocks Using Resonant Column Testing and Numerical Simulations," I received invaluable feedback from global leaders in geotechnical engineering, highlighting practical applications of resonant column data in seismic design and the need for hybrid experimental-numerical validation. Attending the "NGL, GMDB, and VsPDB Database Exploration workshop" equipped me with hands-on skills in leveraging these critical databases for shear wave velocity profiling and geotechnical site characterization, directly enhancing my ability to integrate real-world data into rock dynamics models.

Engaging with sessions on topics such as "Dynamic Properties of Geomaterials" and "Rock Mechanics Under Cyclic Loading" provided crucial insights into emerging trends, including machine learning for predicting energy dissipation in jointed rocks and advanced finite-element simulations of flexural modulus under resonant conditions. I was particularly inspired by keynote discussions on integrating laboratory testing with in-situ measurements, which revealed diverse approaches to tackling energy dissipation in intact rocks—from multiscale modeling to probabilistic seismic hazard analysis. This exposure solidified a key lesson: "advanced geotechnical research thrives on seamless fusion of experimental precision and computational innovation." True progress demands blending resonant column insights with tools like FLAC or ABAQUS to simulate real-field complexities.

Beyond the technical gains, the congress catalyzed personal and professional growth. Interactions with peers from ASCE and ISSMGE bolstered my confidence in presenting complex simulations and fostered new collaborations for future joint rock testing projects. Exploring Salt Lake City's geotechnical landmarks, like nearby fault zones, enriched my understanding of regional hazards. Geo-Congress 2026 was not just a platform to share my work; it also armed me with fresh methodologies, networks, and drive to advance my postdoctoral research on particle-size effects in dynamic soil response with greater real-world impact.

People you met:

At Geo-Congress 2026 I had the opportunity to interact professionally with several leading researchers and practitioners. The key individuals I met, along with their affiliations, are listed below:

1) Dr. Helen D. Robinson – GEI Consultants, USA.
2) Dr. Anand J. Puppala – University of Texas at Arlington, USA.
3) Dr. Surya Sarat Chandra Congress – University of Texas at Arlington, USA.
4) Dr. Krishna R. Reddy – University of Illinois at Chicago, USA.
5) Prof. Deepankar Choudhury – Indian Institute of Technology Bombay, India.
6) Prof. Brijes P. Mishra – University of Utah, USA.
7) Dr. Roshina Babu – University of Utah, USA
8) Dr. Katerina Ziotopoulou – University of California, Davis, USA.
9) Dr. Sebastian Lobo-Guerrero – Universidad de Los Andes, Colombia.
10) Dr. Nich Hudyma – University of Utah, USA.
11) Dr. Shahrzad Roshankhah – University of Utah, USA

Main features of the conference:

Geo-Congress 2026 in Salt Lake City was a comprehensive, milestone-style event that effectively combined cutting-edge research, practical design applications, and strong professional-development opportunities. The conference program was well-structured, with parallel sessions covering a broad spectrum of geotechnical topics such as rock and soil dynamics, foundation engineering, unsaturated soils, liquefaction, and geotechnical earthquake engineering. Sessions on dynamic properties of geomaterials and rock mechanics under cyclic loading highlighted advanced laboratory testing methods, including resonant column and cyclic triaxial tests, and their integration with numerical modeling for seismic design. These sessions showcased recent advances in constitutive models, finite-element simulations, and probabilistic approaches for capturing non-linear and time-dependent behavior in rock and soil, which are relevant to current research and practice trends in dynamic soil–structure interaction.

The event featured several keynote and named lectures that provided a broad, high-level perspective on major challenges in geotechnical engineering. The H. Bolton Seed Lecture emphasized the importance of local site conditions and ground-motion amplification, while the Karl Terzaghi and Ralph B. Peck Lectures underlined the need for sound, transparent, and ethically grounded engineering practice. The Shamsher Prakash Lecture focused on geotechnical work in challenging environments such as mountainous and landslide-prone regions, illustrating how geotechnical input shapes infrastructure resilience in complex terrains. These lectures helped contextualize many of the technical sessions and reinforced the idea that laboratory data and numerical models must ultimately connect to real-world performance and societal risk.

Short-term courses added a strongly practical dimension to the conference. A notable feature was the "**NGL, GMDB, and VsPDB Database Exploration Workshop**", which introduced participants to national-scale geotechnical and geophysical databases for site characterization, regional seismic-hazard studies, and site-response analysis. Other short courses on **CPT and pile-foundation design, unsaturated soil mechanics, and AI-based tools for geoprofessionals** demonstrated how traditional geotechnical methods are being enhanced with machine-learning models, data analytics, and real-time monitoring. These courses provided hands-on exposure to emerging workflows that move from laboratory and field data toward more robust, data-driven design and decision-making processes.

The conference also included a dedicated **Student Career Fair** and a range of student-focused activities that strengthened its professional-development component. The

career fair allowed students and early-career professionals to interact with representatives from consulting firms, public-sector agencies, and research laboratories, many of whom were seeking candidates with strong backgrounds in laboratory testing, numerical modeling, and dynamic soil–rock behavior. A student panel on building a geotechnical career offered practical advice on publication strategies, networking, and long-term career planning, reinforcing the importance of visibility through conference participation, collaborations, and knowledge sharing.

Overall, Geo-Congress 2026 offered a rich mix of technical depth, practical training, and professional engagement, framed around contemporary themes such as resilience, sustainability, and digital innovation in geotechnical engineering. The combination of keynote lectures, peer-reviewed technical sessions, short courses, and career-oriented activities created a well-rounded environment where researchers, practitioners, and students could learn from each other and align their work with global priorities in infrastructure safety and performance.

Your comments on the conference:

Geo-Congress 2026 was an exceptionally well-organized and intellectually stimulating conference that truly reflected the breadth and depth of modern geotechnical engineering. The technical quality of the presentations was very high, with a strong mix of fundamental research and practical case studies that clearly demonstrated how laboratory and numerical work can be translated into real-world design and risk-mitigation strategies. The sessions on dynamic soil–rock behavior, rock mechanics under cyclic loading, and advanced constitutive modeling were particularly impressive, combining rigorous theoretical frameworks with detailed experimental and field data.

The presence of many eminent researchers and seasoned practitioners enriched the discussions and gave the conference a very “think-tank”-like atmosphere. Keynote lectures and named sessions provided authoritative perspectives on long-standing challenges as well as emerging frontiers, such as data-driven geotechnics, AI-assisted analysis tools, and resilient infrastructure design. The balance between academic and industry participation created fertile ground for dialogue between theory and practice, and the short-term courses offered practical, hands-on exposure that complemented the more research-oriented sessions.

Organizers fostered a welcoming and collaborative environment through well-structured parallel sessions, clear schedules, and ample networking opportunities during coffee breaks, poster sessions, and social events. This atmosphere made it easy to initiate conversations with senior researchers, exchange ideas, and identify potential common interests for future collaboration. Overall, Geo-Congress 2026 was not only a strong platform for disseminating research but also a highly valuable forum for learning, networking, and shaping the future direction of geotechnical practice and innovation.

Please attach short report (maximum 400 words) suitable for publication in the ISSMGE Bulletin:

Geo-Congress 2026 provided a vibrant and professionally enriching experience that highlighted the evolving role of geotechnical engineering in resilience-driven infrastructure development. Held in Salt Lake City, the conference brought together a diverse international audience of academics, consulting engineers, and government practitioners under the ASCE Geo-Institute umbrella, with strong alignment to ISSMGE-level themes such as advanced testing, numerical modeling, and seismic-risk assessment. The program was broad yet cohesive, combining keynote and named lectures with a rich set of parallel sessions that spanned dynamic soil–rock behavior, rock mechanics under cyclic loading, foundations, unsaturated soils, and geotechnical earthquake engineering.

The prominence of both theoretical and applied work was striking. Keynotes and invited talks addressed long-standing challenges in constitutive modeling, site characterization, and performance-based design, while many technical sessions showcased concrete case studies and laboratory data that linked experimental results to real-world projects. The conference also emphasized cross-cutting topics such as unsaturated soil mechanics, tailings dam safety, and the use of lightweight and sustainable geo-materials, reflecting an increasing awareness of environmental and sustainability considerations in geotechnical practice. Short-term courses, including the “NGL, GMDB, and VsPDB Database Exploration Workshop,” gave participants practical familiarity with large-scale geotechnical and geophysical databases, illustrating how regional data can support site-response analyses, seismic-hazard zoning, and performance-based design workflows.

Other courses on CPT and pile-foundation design, unsaturated soil mechanics, and AI-assisted tools underscored the growing integration of data science and machine-learning techniques into everyday geotechnical workflows, from parameter calibration to probabilistic hazard assessment. These sessions helped participants see how classical methods can be enhanced by real-time data, surrogate models, and digital-twin concepts, which are increasingly relevant for monitoring infrastructure performance and improving decision-making under uncertainty. The conference also included a Student Career Fair, networking panels, and social events that encouraged interaction between early-career researchers, PhD students, and senior professionals.

Overall, Geo-Congress 2026 was not only a venue to present and critique cutting-edge research but also a forward-looking forum that connected theory, practice, and technology. The experience has significantly broadened my understanding of current research frontiers and has reinforced the importance of interdisciplinary, data-rich approaches in addressing complex geotechnical challenges. I am very grateful to the ISSMGE Foundation for the financial support that enabled my participation and for the opportunity to contribute to and learn from this dynamic international community.

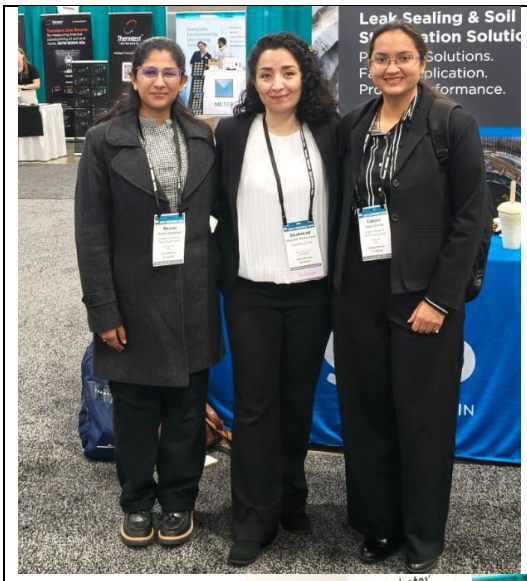
Photographs from Conference:


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Conclusions
Rock internal structure (grain, pore, microcrack) reacts differently to strain increases, so their dynamic response naturally changes with strain.
Higher strain reduced resonant frequency and dynamic Young's modulus, showing stiffness loss. At larger strains, microcracks open and grow, so the rock becomes less stiff and vibrates at lower natural frequencies.
Damping ratio changed nonlinearly and differently for each material, separate from stiffness trends. Energy dissipation depends on friction, crack closure/opening, and contact, which vary by rock type and do not follow a simple relationship with stiffness reduction.
Stiffer, denser rocks (Makrana marble, Jodhpur sandstone) showed stronger nonlinearity; Jodhpur sandstone had the highest damping, gypsum plaster the lowest at high strain. These rocks can store more elastic energy, so when damage starts, their properties change more sharply; Jodhpur sandstone's grain contacts dissipate more energy than the finer, more homogeneous gypsum plaster.
Numerical modelling matched the experiments and confirms that strain-dependent properties are important for seismic design and vibration control of rock structures. When models use strain-dependent stiffness and damping, they better reproduce real behaviour, enabling designers to more reliably predict displacements and vibrations during earthquakes.


Sakshi


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