



FUTURE LEADERS 2019-2020

Rob Bewick (Ph.D., M.A.Sc., B.Eng., P.Eng.(ON)) is a lead mining rock mechanics engineer at Golder Associates. For the firm, he has completed expert reviews, site visits, and integrated mine scale stability optimizations for several seismic events and rockbursts; these conditions have caused damage and closure to mine excavations at both the local and global scales. He has provided practical recommendations for rehabilitation, mining sequence, and ground support for mines in Australia, Brazil, Canada, Indonesia, Sweden, and USA. Rob is responsible for the technical aspects of projects, business development, and the mentoring of personnel in several of Golder's North American offices. Rob has extensive experience in deep and shallow underground hard rock environments and block caving. His primary underground experience is complemented by crown pillar and large open pit slope site characterization and design. For the last seven years Rob has been involved in rock mechanics innovations for block caving through the Rio Tinto and is currently leading Golder's preferred consultancy with PTFI's Grasberg Operations since 2014. Dr. Bewick has worked on gold, base metal, diamond, iron ore and industrial mineral projects and in operating mines.

Chia Weng Boon obtained his doctorate at Oxford University in 2013, preceded by a B. Eng. at Nanyang Technological University in 2009. He was awarded the Rocha Medal in 2016 by the International Society for Rock Mechanics and Rock Engineering (ISRM). He was a past recipient of the Lee Kuan Yew Gold Medal, Professional Engineers Board Gold Medal (Singapore) and King's Scholarship (Malaysia). He has been with Gamuda Engineering Sdn Bhd, and seconded to the design-and-build contractor joint venture, MMC-Gamuda KVMRT (T) Sdn Bhd, where he contributes to the construction of underground tunnels and stations in the 1st and 2nd Line of the underground mass rapid transit project in Kuala Lumpur. In this project, the alignment traverses through the karstic limestone formation, metamorphic quartzite and phyllite formation, granitic geological unit and quartz intrusions. His key contributions in rock engineering are: rock bolt support mechanisms, i.e. reinforced rock unit, beam building or suspension, in relation to the rock bedding thickness and robust and efficient algorithms for modeling jointed rock in the distinct element method. Dr. Boon served as a reviewer for several international scientific journals (including Tunneling and Underground Space Technology, Computers and Geotechnics, and Engineering Geology). He is a committee member at the Geotechnical Engineering Technical Division, as well as Tunneling Underground Space Technical Division of the Institution of Engineers Malaysia.

Shengli Chen is an Assistant Professor of the Geotechnical Engineering Program in the Department of Civil & Environmental Engineering at Louisiana State University. He received his Ph.D. degree in Petroleum Engineering from the Integrated Poromechanics Institute at the University of Oklahoma in December 2012, and was a Research Petroleum Engineer with Aramco Research Center at Houston from February 2013 to August 2014. His main research interests include theoretical and computational geomechanics, poromechanics and elastoplastic constitutive modelling of geomaterials, wellbore stability analysis and hydraulic fracturing modelling, and pile foundation and soil structure interaction. Dr. Chen has published around 40 international journal papers in the areas of geomechanics and geotechnical/petroleum engineering, in the well-respected journals like *Géotechnique* and *Proceedings of the Royal Society A*. He has been serving as an Associate Editor of the *SPE Journal* since 2014, and currently serves as a member of two ASCE committees of Engineering Mechanics Institute (EMI) Elasticity Committee and Poromechanics Committee.

Sevda Dehkhoda is a Senior Mining Engineer with Hatch, a global consulting firm across the mining, energy and infrastructure sectors. Based in Brisbane in Australia, Sevda applies her knowledge in mining technology and innovation, bridging the gap between development and widespread application. She holds a Bachelor and Master of Science in Mining Engineering, and a PhD in pulsed water jet rock breakage from University of Queensland. Sevda's core expertise is in rock fracture mechanics and alternative rock breakage systems for hard rock mining. Sevda's career spans over academia, research & development, and technical consulting for mining and civil industries in Australia and the Middle East. Throughout that time, Sevda has published over 40 journal articles, peer reviewed conference papers, research reports and white papers, and has served as a reviewer for international conferences and scientific journals in the areas of mechanical cutting, water jet rock breakage and alternative rock breaking systems. She is an adjunct senior lecturer at the University of Queensland and co-advises PhD students at leading Australian university including Monash University, University of New South Wales and University of Tasmania.

D. Nicolas Espinoza is an Associate Professor in the Hildebrand Department of Petroleum and Geosystems Engineering at The University of Texas at Austin. Dr. Espinoza earned his Civil Engineering diploma from Universidad Nacional de Córdoba in 2006, and his MS and PhD degrees from the Georgia Institute of Technology in 2008 and 2011. His primary research interests include mechanics and physics of natural porous solids and granular media, including applications to advanced completion techniques, reservoir geomechanics, methane recovery from microporous organic rocks, methane hydrate-bearing sediments, and carbon geological storage. Dr. Espinoza has co-authored over 40 peer-reviewed journal articles, served as an expert reviewer for several scientific and engineering journals, and given seminars at various leading research and educational institutions.

Yi Fang is a postdoctoral fellow in the Institute for Geophysics at the University of Texas at Austin. His research interests focus on reservoir geomechanics and geofluids with applications to geoen지니어ing activities, such as enhanced geothermal system, induced seismicity, CO₂ sequestration, and submarine hydrate reservoir characterization and recovery. He received his Ph.D. in *Energy and Mineral Engineering* at the Pennsylvania State University in 2017, an M.S. in *Geology* from California State University, Long Beach in 2013, and a B.E. in *Civil Engineering* at China University of Geosciences, Wuhan in 2011. He has authored and co-authored over 30 technical papers. He also serves as a technical reviewer for ARMA, URTEC, JGR, GRL, WRR, SPEJ, Fuel, and other international journals.

Yongcun Feng is a research associate in the Hildebrand Department of Petroleum and Geosystems Engineering at The University of Texas at Austin. He obtained his Ph.D. degree from The University of Texas at Austin in 2016, and his MS and BS degrees in 2012 and 2009 from China University of Petroleum (Beijing), all in petroleum engineering. His research interests lie primarily in geomechanics related issues faced by the petroleum industry, including lost circulation, well integrity, sand production, reservoir compaction, and induced faulting/seismicity. He has authored or co-authored over 20 peer-reviewed journal papers and 8 conference papers. Dr. Feng will join China University of Petroleum (Beijing) as a faculty member in petroleum engineering in September 2019.

Luke P. Frash is a Staff Scientist at Los Alamos National Laboratory. Luke earned his BS, MS, & PhD in Engineering at Colorado School of Mines, United States, with the most recent degree conferred in 2014 and one semester completed at University of Canterbury, New Zealand. His research areas include theory, modelling, experiments, and field work for the study of rock fracturing and fluid flow as applied to unconventional oil & gas well stimulation, enhanced geothermal systems, CO₂ sequestration, well integrity, containment of subsurface waste disposal, and anthropogenic induced seismicity. Multi-well fracture caging for controlling induced seismicity and scalable en-echelon theory for relating shear fracture aperture and displacement are examples of his recent work. Since 2012, he has published more than 20 papers at ARMA. He is also an aerospace enthusiast and aviator.

Bruno Gonçalves da Silva is an Assistant Professor at the New Jersey Institute of Technology (NJIT). His research interests are the experimental and numerical study of the fracturing processes of rocks and concrete subject to diverse loading conditions, with field-scale applications to the energy, environment, and civil engineering fields. Gonçalves da Silva studied for his BSc degree in Civil and Environmental Engineering at the Instituto Superior Tecnico, Portugal. He later earned his MSc and PhD in Civil and Environmental Engineering from the Massachusetts Institute of Technology (MIT). He also worked as a geotechnical and structural engineer in the United States, England and Portugal. Dr. Gonçalves da Silva was the co-chair of the 53rd US Rock Mechanics / Geomechanics

Symposium held in New York City in 2019. His current research focuses on investigating the multi-scale physical mechanisms responsible for the fracturing of rocks that are subject to confinement stresses and hydraulic pressures, including the seismicity caused by their fracturing. Based on laboratory tests, his research group develops theoretical and numerical models to simulate and interpret fracturing mechanisms at both visible and microscopic scales. Gonçalves da Silva has also been studying, at the fundamental level, the physical mechanisms involved in thermally-induced spalling of concrete tunnel liners.

Mahdi Haddad is a postdoctoral fellow at the Bureau of Economic Geology at The University of Texas at Austin, where he conducts research on geomechanics of induced seismicity through the TexNet project. Previously, Haddad worked as a research geomechanics intern at FracGeo, where he developed continuum damage mechanics models using the material point method for the estimation of the stimulated reservoir volumes. He also spent time as a research geophysics intern at Total E&P Research and Technology USA, where he proposed a method for improving the interpretation of microseismicity through 3D finite-element fracture-intersection models. His SPEJ publication on this topic awarded him the 2018 Cedric K. Ferguson Medal from SPE International. Haddad has authored 16 peer-reviewed journal articles and conference papers on induced seismicity, multiple-stage hydraulic-fracture design, refracturing optimization, stimulated naturally fractured reservoir simulation, and smoothed particle hydrodynamics. He is an active member of SPE and ARMA, serves as a technical reviewer for SPE journals and various rock and fracture mechanics journals and as a technical judge for the University of Texas SPE regional paper contests. Haddad served as a technical committee member and session chairperson in the 51st and 53rd U.S. Rock Mechanics/Geomechanics Symposia, respectively. Mahdi holds BS degrees in mechanical and petroleum engineering and an MS in mechanical engineering/energy conversion from Sharif University of Technology, Iran, as well as a PhD in petroleum engineering from The University of Texas at Austin.

Jian Huang is a research scientist working for Total EP Research & Technology USA in Houston. Previously, he was a senior geoscientist in the department of Geoscience Research and Development at Weatherford International from 2013 to 2019. His research focuses on fracture modeling and emerging stimulation technologies. Currently, Huang holds two granted US patents and five pending applications in reservoir geomechanics. He has more than 10 years' research experience in petroleum geomechanics and published 30+ technical papers. He holds a master's degree in geology from University of Houston, and a PhD degree in petroleum engineering from Texas A&M University.

Evangelia Ieronymaki is an Assistant Professor of Geotechnical Engineering at the department of Civil and Environmental Engineering at Manhattan College, NY. She holds B.S. and M.S. (2008) degrees in Civil Engineering from the National Technical University of Athens (NTUA) in Greece, and S.M. and Ph.D. (2015) in Geotechnical and Geoenvironmental Engineering from the Massachusetts Institute of Technology (MIT). Her research deals primarily with numerical modeling, soil behavior, deep excavations, soil-structure interaction, and tunneling. For her PhD she collaborated closely with the Crossrail Tunnel construction consortium (BAM-Ferrovial-Kier) and performed part of her research on a construction site in London, UK. She has authored and co-authored more than 15 technical papers, and has received several prizes and awards, including MIT Edward Linde Presidential fellowship and DFI Women in Deep Foundations award (2017). Dr. Ieronymaki is a licensed professional engineer and member of the Technical Chamber of Greece, an Associate Member of the American Society of Civil Engineers (ASCE), and Future Leader of the American Rock Mechanics Association (ARMA). She is also member of the ASCE/Geo-Institute Underground Engineering and Construction committee, and the DFI Tunneling and Underground Systems and Project Information Management Systems committees.

Seunghye Kim is an Assistant Professor in the Department of Civil and Environmental Engineering at the University of Nebraska-Lincoln (UNL). Dr. Kim received his B.S. and M.S. from Korea Advanced Institute of Science and Technology (KAIST) and Ph.D. in Civil and Environmental Engineering from Georgia Tech. His graduate study focused on the subsurface investigation using surface waves (M.S.) and the geotechnical implications of CO₂ geologic storage (Ph.D.). He continued his research on this topic as a postdoctoral fellow at the Bureau of Economic Geology, a part of the University of Texas at Austin. Before joining UNL, he was an Assistant Professor at Western New England University. His main research area includes the pore-scale study of reactive/multiphase fluid flow in porous media, hydro-chemo-thermo-mechanically coupled processes in energy-geotechnology, and underground utilization. These topics are to tackle challenges for operations such as carbon utilization & geologic storage, geothermal energy, energy geo-storage, wastewater injection, etc. He has four years of industry experience related to the foundation design and the analysis of cut-slopes and tunnels.

Qinghua Lei is a Lecturer and Senior Scientist in Engineering Geology at the Department of Earth Sciences, ETH Zürich, Switzerland. He holds a bachelor's degree (2009) and a master's degree (2012) in Civil Engineering from Tongji University, China. He obtained his PhD degree (2016) in Rock Mechanics (fully-funded by the departmental scholarship) from Imperial College London, UK. Then, he worked as a Postdoctoral Research Associate in Fluid Mechanics at Imperial College London between 2016 and 2018. Dr Lei is the winner of the 2019 Rocha Medal from the International Society for Rock Mechanics and Rock Engineering (ISRM). He is also the recipient of the 2015 Rock Mechanics Research Award

and the 2016 NGW Cook PhD Dissertation Award from the American Rock Mechanics Association (ARMA). His research covers many cutting-edge topics in the field of rock mechanics and rock engineering. His research interests include coupled processes in geological media, fracture mechanics, damage mechanics, flow and transport in fractured porous media, seismic wave propagation, slope stability, stress characterization and numerical modelling. Dr Lei is a member of the ISRM Commission on Thermal-Hydro-Mechanical-Chemical Processes in Fractured Rock.

Botao Lin is a professor at the College of Petroleum Engineering, the China University of Petroleum at Beijing (CUPB). His current research interests are focused on petroleum-related geomechanics, including stimulation of oil sand reservoirs, hydraulic fracturing in conglomerate formations, flow simulation in fracture networks of shale reservoirs, and prediction of soil-structure interaction in the exploitation of deep-water resources. Recently he started to investigate the AI application in the petroleum industry. He also provides a variety of consulting services for major oil companies such as PetroChina and Saudi Aramco. Before joining CUPB, he earned his Ph.D. degree in civil engineering from the University of Oklahoma. He has fifty-plus technical publications and six registered patents up to date.

Tianshou Ma is an Associate Professor in the Petroleum Engineering School at Southwest Petroleum University, P.R. China. He received his PhD Degree in Oil & Gas Well Engineering from Petroleum Engineering School at Southwest Petroleum University in 2015. His main research focuses on petroleum related rock mechanics and measurement while drilling (MWD), more specifically, safe and efficient drilling and exploitation complex reservoirs. These include rock mechanics characterization, wellbore stability analysis, lost circulation prevention, wellbore integrity analysis, new MWD tools, and advanced drilling technology. He has published 50+ journal articles in various international journals and 10+ conference papers in various international conferences. He holds 20+ patents in petroleum related rock mechanics, MWD and advanced drilling technology areas. He received the Candidature Proposal of Eni Award 2015 and Eni Award 2016 – the New Frontiers of Hydrocarbons (Upstream Prize) – for work on the wellbore stability of shale gas formations. He is an expert reviewer for 30+ scientific and engineering journals, and he was awarded as “Outstanding reviewer” seven times.

Xiaodong Ma obtained his PhD degree in geological engineering (2014) from the University of Wisconsin-Madison, and conducted post-doctoral research at the Stress and Crustal Mechanics Group, Stanford University, before joining ETH Zürich in 2017. He is leading the geomechanics efforts in the Bedretto Underground Laboratory for field experiments related to enhanced geothermal system and induced seismicity. He had previously tackled a variety of geomechanical challenges, including the experimental characterization of the

true triaxial mechanical response of porous sandstones subject to true triaxial stresses, static/dynamic poroelastic behavior of unconventional reservoir rocks, and stress variation in shales and its effect on the effectiveness of hydraulic fracturing. His research interest lies in the integrated geomechanics study of combining multi-scale field, laboratory and theoretical approaches for subsurface resources and fundamental geological processes.

Anahita Modiriasari is a Geotechnical Engineer at WSP USA in New York City, where she works on local and national infrastructure projects. Before joining WSP, she was a Post-Doctoral research assistant in geotechnical/geomechanical engineering in Resilient ExtraTerrestrial Habitats (RETH) group at Purdue University, where she worked on the development of the expertise needed to address the grand challenge of permanent human settlements on the Moon and Mars. Leveraging her background in geomechanics and underground construction, she analyzed the possibility of the existence and geotechnical structural stability of lunar lava tubes so as to determine their suitability as safe and resilient permanent extraterrestrial habitats. Dr. Modiriasari earned her Ph.D. in Civil (Geotechnical) Engineering from Purdue University in 2017. She holds a Master's and Bachelor's Degree in Mining Engineering from Amirkabir University of Technology, Tehran, Iran. Her areas of interest include geotechnical engineering, rock fracture mechanics, wave propagation through fractured media, tunneling and underground construction. Dr. Modiriasari's work has been published in peer-reviewed journals and international conferences. Her work was recognized by her peers with the 2016 Best Poster Award at the 50th US Rock Mechanics/Geomechanics Symposium and by the 2018 Dr. N.G.W. Cook Ph.D. Dissertation award by American Rock Mechanics Association (ARMA).

Jeffrey Oke is a Geomechanics consultant at RockEng Inc. (formerly Mine Design Engineering Inc.) since 2015 and a scientific advisor at META innovations technologies. He completed his Ph.D. studies in 2016 on the numerical, empirical, and analytical analysis of umbrella arch support systems in underground excavations at Queen `s University.

Mojtaba Pordel Shahri, Ph.D., P.E., is a Senior Scientist at Apache Corporation in Houston, Texas. In his current role, he is developing and implementing advisory solutions on Apache Drilling Real-Time Package (Drilling Intelligence Guide – DIG) by leveraging both physical and data analytics modeling capabilities. He is also developing different coupled physics-based and analytical solutions for completion and production optimization. Mr. Shahri has been selected as Society of Petroleum Engineers (SPE) Distinguished Lecturer for 2017-2018. He has authored more than 50 technical papers and holds 8 US patent applications. Shahri received SPE Star (2012), SPE Henry DeWitt Smith (2012), SPE Nico van Wingen (2013), SPE-GCS Exemplary Volunteer (2016 and 2018), and SPE Regional Young Member Outstanding Service (2016) Awards. He holds a Ph.D. degree in petroleum engineering from the University of Tulsa.

Hamid Roshan is a Senior Lecturer in the School of Minerals and Energy Resources Engineering at UNSW Sydney, Australia and the leader of GeoEngineering Research Laboratory (www.georesearch-lab.com). Hamid received his PhD degree in Petroleum Geomechanics from School of Petroleum Engineering at UNSW Sydney in 2012. His main research area centres on micro- to macro-scale fundamental understanding of multi-physical processes in porous media using new theoretical, experimental and numerical developments that have a wide range of applications from petroleum to mining, civil and environmental engineering. Before joining UNSW Sydney, Hamid worked as a Petroleum Engineer with a major Oil & Gas producer in Middle East. He holds two patents in rock mechanics and has co-authored over 45 peer-reviewed journal articles. He is also an editorial board member of Computers and Geoscience and an expert reviewer of several scientific and engineering journals.

Arash Dahi Taleghani is a tenured associate professor of petroleum engineering at Pennsylvania State University. Before joining Penn State, he was an associate professor of Petroleum Engineering at Louisiana State University. He earned a B.S. and M.S. in civil engineering from Sharif University of Technology and his Ph.D. in petroleum engineering from the University of Texas at Austin. He is a registered professional engineer. Dr. Dahi Taleghani is the associate editor of ASME journal of Energy Resources and Technology and has numerous publications and four patent applications in the field of drilling and completion. In 2014, he received the Distinguished Achievement Award for Petroleum Engineering Faculty from the Society of Petroleum Engineering (SPE). He has also received SPE Eastern North America Regional Completion Optimization and Technology in 2017. He is currently conducting research in reservoir geomechanics, hydraulic fracturing, wellbore integrity, drill bit mechanics and poroelasticity. He is teaching undergraduate and graduate courses in petroleum rock mechanics, mechanical earth modeling, hydraulic fracturing, well-logging, production engineering and well completion techniques.

Bryan Tatone is the laboratory testing lead and a co-founder of Geomechanica Inc., a rock mechanics software and consulting company, based in Toronto, Ontario, Canada. Bryan manages the day-to-day rock mechanics laboratory testing activities and continues to design and improve testing equipment to expand Geomechanica's testing capabilities. Bryan holds a BAsC degree in Geological Engineering (University of Waterloo, 2007) and MASc and PhD degrees in Civil Engineering (University of Toronto, 2009, 2014). His graduate research focused on rock discontinuity roughness and shear behavior, which he has studied both experimentally via micro-CT imaging and numerically via the application of hybrid continuum-discontinuum numerical methods. For this work, Bryan was the recipient of the 2017 Rocha Medal awarded by the International Society of Rock Mechanics.

Gabriel Walton received his Bachelors and Ph.D. degrees in Geological Engineering from Queen's University in Canada, and is currently an Assistant Professor at the Colorado School of Mines. In addition to his academic efforts, he has also worked as an independent consultant and has led applied research efforts in collaboration with tunneling and mining industry partners. His research interests include numerical modeling, mine ground control, applications of remote sensing and geophysics in rock mechanics and rock engineering, rockmass characterization, and post-peak behavior of rocks and rockmasses. In addition to advising students in the Geological Engineering program at the Colorado School of Mines, Gabriel is also actively involved in the interdisciplinary Underground Construction and Tunnel Engineering graduate program - the only one of its kind in North America.

Bisheng Wu is an assistant professor at the Department of Hydraulic Engineering, Tsinghua University, China. He obtained his PhD degree of Applied Mathematics in 2008 from the University of Wollongong (Australia), Master degree of Engineering Mechanics in 2005 from Tsinghua University, and Bachelor degree of Mechanical Engineering in 2002 from Xi'an Jiaotong University (China). He joined CSIRO Australia in 2009 as a postdoctoral research fellow, was promoted to research scientist (indefinite term) in 2012, and then joined Tsinghua University in 2018. His research focuses on geomechanics related to efficient and renewable exploration of subsurface energy resources. He has published around 40 journal papers, worked as session chair or organizing committee member of international conferences more than 10 times, was invited to be a reviewer for more than 20 internationally renowned journals, and was designated a Distinguished Reviewer for International Journal of Rock Mechanics and Mining Sciences, Energy, International Journal of Solids and Structures, Applied Thermal Engineering and Geothermics.

Qianbing Zhang is a Senior Lecturer in the Department of Civil Engineering at Monash University, Australia. He received his Bachelor degree from Southwest Jiaotong University in 2007, his Master degree from Shandong University (China) and his PhD from the Swiss Federal Institute of Technology in Lausanne (EPFL) in 2014. Thereafter, Dr Zhang pursued post-doctoral research at the University of Cambridge. In 2016, he was awarded the Rocha Medal Runner-up Certificate from the International Society for Rock Mechanics. His research focuses on the development and application of experimental techniques and multi-physics computational tools to understand the progressive failure of geomaterials and structures under extreme conditions, including natural hazards (e.g., earthquake, landslides and explosive volcanic activity) and human-made disasters (e.g., terrorist attacks and induced earthquakes). He has co-authored over 40 ISI journal articles, and regularly reviews grant proposals, national and international theses, and papers for more than 20

journals. He served as an Associate Editor of Tunneling and Underground Space Technology (Elsevier) in 2016-2018; he was appointed an Editor-in-Chief since 2019.

Cheng Zhu is an assistant professor in the Department of Civil and Environmental Engineering at Rowan University. His research primarily concerns multi-scale rock behavior under thermo-hydro-chemo-mechanical coupled processes across various time scales, with emphasis placed on damage and healing mechanics, time-dependent deformation, microstructural characterization, and computational geomechanics, for applications in geological storage of energy (e.g., oil, gas, compressed air energy storage) and waste (e.g., wastewater injection, nuclear waste disposal). Prior to joining Rowan University, he worked in the Bureau of Economic Geology at the University of Texas at Austin as a postdoctoral fellow for one year. At Rowan University, he teaches Geotechnical Engineering, Foundation Engineering, and Rock Mechanics.

Haiyan Zhu is currently a professor in the College of Energy & State Key Lab. of Oil and Gas Reservoir Geology and Exploitation, Chengdu University of Technology, Chengdu, China. He holds a PhD degree in petroleum-related rock mechanics and engineering from the China University of Petroleum, Beijing. He previously worked at the SINOPEC Jiangnan Oilfield Company for one year between 2009 and 2010, and at Southwest Petroleum University for five years as an associate professor in the Petroleum Engineering between 2013 and 2018. His research interests are petroleum-related geomechanics, including laboratory experiments and numerical simulation of rock breaking, wellbore stability, reservoir stimulation and 4D geostress evolution. He has authored or co-authored over 50 peer-reviewed journal papers. He is also an associate Editor of Journal of Petroleum Science and Engineering.