The Center for Wave Phenomena (CWP) is an interdisciplinary research and graduate education program in seismic exploration, monitoring and wave propagation. The focus of the program is on seismic modeling, imaging and inversion methods, as well as on improving the accuracy and efficiency of seismic processing algorithms, especially for application to regions of structural complexity.

Part of CWP is the Consortium Project on Seismic Inverse Methods for Complex Structures (“Consortium,”) an international group of industry sponsors. We are associated with the Department of Geophysics at the Colorado School of Mines (CSM), a public research university dedicated to engineering and applied sciences.

CWP faculty have a broad range of research interests and thrive on solving problems of practical interest to the exploration industry. CWP faculty are: Dave Hale (CWP Director), Paul Sava, Roel Snieder and Ilya Tsvankin. CSM Professors Emeriti and past CWP Directors Norm Bleistein and Ken Larner continue to work closely with CWP on a broad range of research interests. Over the years, CWP research directions have expanded to reflect the talents of our faculty and students, as well as to meet the needs and interests of our Consortium sponsors.

CWP is strongly committed to quality graduate education in geophysics. CWP students form an international group with a large range of study and research interests. Their backgrounds are primarily in earth sciences, applied mathematics, computer science and physics. CWP graduates are recruited for employment by industry, government and academia following the completion of their degrees from CSM.

For additional information regarding CWP or the Consortium, please contact Pamela Kraus, Program Assistant, at pkraus@mines.edu or visit our website.

http://cwp.mines.edu
CWP Faculty

Dave HALE - Professor and CWP Director

Dave Hale received his B.S. in physics from Texas A&M University and his Ph.D. in geophysics from Stanford University. He has worked as a field seismologist and research geophysicist for Western Geophysical, as a senior research geophysicist for Chevron, as an associate professor at the Colorado School of Mines, as a chief geophysicist and software developer for Advance Geophysical, and as a senior research fellow for Landmark Graphics. Dave returned to the Colorado School of Mines in 2005 as the Charles Henry Green Professor of Exploration Geophysics, and has served as CWP Director since 2011. Dave received the Virgil Kauffman Gold Medal from the Society of Exploration Geophysicists (SEG) for his work on dip-moveout processing of seismic data. He also received the Society of Exploration Geophysicists awards for Best Paper in Geophysics in 1992 (imaging salt with seismic turning waves) and Best Paper Presented at the Annual Meeting in 2002 (atomic meshing of seismic images).

Paul SAVA - Associate Professor

Paul Sava is an Associate Professor of Geophysics and a member of the Center for Wave Phenomena at Colorado School of Mines. He holds an Engineering degree in geophysics (1995) from the University of Bucharest, an M.Sc. (1998) and a Ph.D. (2004) in geophysics from Stanford University where he was a member of the Stanford Exploration Project. His main research interests are in wavefield seismic imaging, stochastic imaging and inversion, computational methods for wave propagation, numeric optimization and high performance computing. He is a recipient of a Stanford Graduate Fellowship (1997-2000) from Stanford University and of a Jackson Young Scientist Fellowship (2006-2007) from the University of Texas (Austin). He is also a recipient of three Awards of Merit for best student presentations at the Society of Exploration Geophysicists (SEG) conventions (1999, 2001 and 2004) and of a Honorable Mention in the category Best Paper in Geophysics (2003) for “Angle-domain common-image gathers by wavefield continuation methods,” co-authored by Sergey Fomel. The SEG recognized him in 2007 with the Reginald Fessenden Award for his work on wave-equation angle-domain imaging. He is a member of SEG, EAGE, and AGU, and currently serves as Education Officer on the EAGE Board.

Roel SNIEDER - Professor

Roel Snieder holds the W. M. Keck Foundation Distinguished Chair in Basic Exploration Science at the Colorado School of Mines. He received a Master’s Degree in geophysical fluid dynamics from Princeton University in 1984 and a Ph.D. in seismology from Utrecht University in 1987. From 1997 to 2000, he was chairman of the Faculty of Earth Sciences at Utrecht University. In 2000, he was elected as a Fellow of the American Geophysical Union (AGU) for important contributions to geophysical inverse theory, seismic tomography, and the theory of surface waves. He has been a member of the Earth Sciences Council of the U.S. Department of Energy from 2003 to 2011. The second edition of his book, A Guided Tour of Mathematical Methods for the Physical Sciences, was published in September 2004. In 2008, Roel worked for the Global Climate and Energy Project at Stanford University on global energy outreach and education. Roel and Ken Larner are co-authors of The Art of Being a Scientist, which was published in August 2009. He serves on the Society of Exploration Geophysicists (SEG) committee, Geoscientists Without Borders, as well as on the Editorial Boards of the Journal of the Acoustical Society of America and the European Journal of Physics. Roel is a foreign member of the Royal Netherlands Academy of Arts and Sciences and he was elected as Honorary Member of the Society of Exploration Geophysicists in 2011. He served as CWP Director from June 2008 to May 2011. Prof. Snieder has also been serving as Chief of Geneseo Fire and Rescue since July 2012.

Ilya TSVANKIN - Professor

Ilya Tsvankin is a Professor of Geophysics at the Colorado School of Mines, who served a four-year term (2004-08) as CWP Director. He received his Ph.D. in geophysics from Moscow State University in Russia. Before coming to CWP, Ilya worked as deputy head of the laboratory “Geophysics of Anisotropic Media” at the Institute of Physics of the Earth in Moscow and then as a consultant to Amoco Production Research in Tulsa, OK. His research interests are in seismic wave propagation, seismic processing, and fracture characterization, particularly in developing inversion and processing methods for anisotropic media. The third edition of Ilya's widely used monograph, Seismic Signatures and Analysis of Reflection Data in Anisotropic Media, came out in 2012 (SEG, Geophysical References Series). In 2011 SEG published his new book, Seismology of Azimuthally Anisotropic Media and Seismic Fracture Characterization, co-authored by Ilya's long-time collaborator Vladimir Grechka of Marathon Oil. Since 2002, Vladimir and Ilya have been teaching a short course on seismic anisotropy as part of the SEG Continuing Education Program. Ilya is the recipient of the SEG Virgil Kauffman Gold Medal for outstanding contribution to the advancement of the science of geophysical exploration (1996). In May 2011 he was elected a Fellow of the Institute of Physics (IOP), a leading international physics society.
University Professors Emeriti

Norman BLEISTEIN

Norman Bleistein was a CWP research leader from its inception in 1984 until he retired in 1999, serving as CWP Director until 1996. After receiving his Ph.D. in 1965 from the Courant Institute of Mathematical Sciences at New York University, he spent three years as an assistant professor at the Massachusetts Institute of Technology and fourteen years at Denver University before moving to the Colorado School of Mines. After Norm’s retirement from the Department of Mathematical and Computer Sciences in September 1999, he has remained active with CWP as University Professor Emeritus and Research Professor in Geophysics. He continues research in asymptotic analysis of seismic modeling, migration and inversion; his textbook, Mathematics of Multidimensional Imaging, Migration and Inversion, co-authored by John Stockwell and Jack Cohen, was published in January 2001. This was his third book, the others being on asymptotic expansions of integrals and on the mathematics of wave phenomena. More recent research has focused on the application of Gaussian beams to modeling, migration and inversion. He visited the University of Karlsruhe as a Senior Alexander von Humboldt American Fellow. In 2005, Norm was awarded the lifetime achievement award of Honorary Membership by the SEG. His presentation at that meeting on modeling with one-way wave equations near caustics was designated as one of the top 25 papers. In 2006, a paper co-authored with Yu Zhang and Guan-quan Zhang received the Best Paper Award in Geophysics for 2005. His presentation at the 2008 SEG meeting was ranked among the top 30, the fourth consecutive year for that honor.

Ken LARNER

In 2004, University Professor Emeritus Ken Larner retired as the Charles Henry Green Professor of Exploration Geophysics at the Colorado School of Mines and as CWP Director; he remains actively involved with CWP. After receiving his Ph.D. in geophysics from the Massachusetts Institute of Technology in 1970, he joined Western Geophysical Company where he became vice president for geophysical research in 1979. The recipient of the 1988 Conrad Schlumberger Award of the EAGE, he was Spring 1988 SEG Distinguished Lecturer and SEG president for 1988-89. He received the President’s Award for CSM Outstanding Educator in 1992. In 1996, he received the SEG’s most prestigious honor, the Maurice Ewing Medal. He was the Society of Petroleum Engineers Distinguished Lecturer for 2000-2001. Ken was awarded the P.L. Kapitsa Gold Medal by the Russian Academy of Natural Sciences in 2003. In 2008, he co-authored the book The art of being a scientist: A guide to graduate students and their mentors with Roel Snieder.

CWP Research Associate

John STOCKWELL - Research Associate

John is a research associate with CWP. He is the principal investigator of the Seismic Unix (SU) project, managing the popular CWP/SU open-source software package. SU is the world’s first and most widely used open-source seismic research and processing environments. For his work with SU, John was co-recipient with Jack K. Cohen of the 1994 University to Industry Award from the Technology Transfer Society, and was co-recipient of a Special Commendation of Award from the Society of Exploration Geophysicists (SEG) with Einar Kjartansson, Shuki Ronen and Jack K. Cohen (posthumous). John uses SU as the basis of the Seismic Processing Lab course that he teaches each Fall semester at the Colorado School of Mines and he is presently developing a text book on seismic data processing with SU. John is the CWP Consortium contact regarding confidential software packages and manages the CWP computer system that includes several types of Linux systems. John is co-author of Mathematics of Multidimensional Seismic Imaging, Migration and Inversion, with Norm Bleistein and Jack Cohen. John teaches the graduate level course Mathematics of Seismic Imaging and Migration using this text. He expresses his ongoing passion for mathematics by teaching an informal seminar in Mathematics for Geophysicists. The notes collected from seven years of this provide the basis of a new textbook that John has just started compiling. John received a Distinguished Volunteer Award from the SEG Foundation in 2005 for his Timelines of Geoscience and Geophysics and of Exploration Geophysics and the Petroleum Industry. He is the Editor of the Bright Spots column in The Leading Edge, the Wiki Administrator of the new SEG Wiki (http://wiki.seg.org) and sits on several SEG Committees, including the Online Content Board and the Historic Preservation Committee.
Shingo manages CWP’s communications, website and outreach efforts. Soon after joining CWP in April 2011, he created the CWP website from the ground up, launched it, and became its administrator. He designs and publishes customised CWP e-/print publications, as well as event-specific webpages for CWP’s annual Consortium Project Review meetings and Semi-Annual Meetings, held in conjunction with the Society of Exploration Geophysicists (SEG) annual meetings. Shingo creates and edits numerous screencasts of CWP research presentations, many of which he then used to launch the CWP YouTube channel. Shingo joined CWP following a five-year tenure in health communications at the Colorado Department of Public Health and Environment. He recently celebrated another anniversary as a state employee with a cup of really dark coffee and more work. Before he moved to Colorado, Shingo worked as a bilingual TV news producer in Washington, D.C., and before that, he lived in Japan for five years and worked for the Japanese government. Outside of work, Shingo enjoys date-nights with his wife Catherine and playing with his 2-year-old son Kento, coaching/playing softball, riding his motorbike, lighting up his BBQ grill, supporting the Colorado Rockies despite the ludicrous prices of their ballpark hot dogs, as well as numerous outdoor activities, excluding skyaking. He shamelessly jumped on the bandwagon to support the Denver Broncos when they went to the 2014 Super Bowl. “Shingster the Minister of Sinister” hails from Vancouver, in beautiful British Columbia, as well as Niagara Falls, Ontario (the proper side from which one should view the Niagara Falls). He resides somewhere in Denver’s vast suburbia. Shingo likes dogs, but can’t get himself to own one - yet.

Pamela manages the Center for Wave Phenomena office and provides administrative, technical and organizational support for the Center. She coordinates all logistics of the CWP Project Review Meeting and the CWP Semi-Annual Meeting, originates Consortium contracts and oversees all Center budget work. Pamela has worked for the State of Colorado since April 1982 where she began her career at Colorado State University before transferring to Colorado School of Mines in August 2003. She has been working for CWP since January 2009 and feels this is the best place on campus to work! Pamela is a fourth generation Colorado native, which she is proud of. In her spare time, she enjoys spending time with her husband Dave and her family. Pamela became a grandma in November 2013 to granddaughter Teeghan and of course she is the most beautiful baby in the world! Pamela enjoys spending time at her dad’s summer home in Red Feather Lakes, Colorado and every March she enjoys spending a week in Tucson, Arizona at his winter home.

Diane offers technical writing and oral presentation workshops and supports CWP students as they develop into more confident and effective writers, presenters, and collaborators within our diverse international group. She received a Bachelor of Arts degree in cultural anthropology from Principia College in Illinois and completed a graduate field study (organized through Northwestern University) on the Navajo Reservation in Arizona; this consisted of ethnographic research on bilingual/bicultural education within a Native American community. She also earned a Master of Arts in Language Teaching degree from the School for International Training, Vermont, with certification in English as a Second Language, Spanish and Multicultural Education. Recently, Diane designed CODE (Collaborative Online Discussion on Ethics) -- a service for graduate students to explore ethical issues on campus and in their careers. She also offers various workshops through the Colorado School of Mines Writing Center and teaches the professional skills course “Tools for Success: Integrating into the CSM Environment.” Her current professional interests include encouraging cross-cultural sensitivity on campus and helping international graduate students negotiate various transitions to successfully acculturate within a new academic environment. Diane has a passion for wild spaces and slips into the mountains and canyons for trail running, backpacking, canoeing, biking, and cross-country skiing.
**Elias ARIAS**

Degree Program: MS, Geophysics  
Country: USA

Elias received his Bachelor of Science degree in Geophysical Engineering from the Colorado School of Mines while competing on the school's wrestling team. He held two internship positions, first at Landmark during the summer between his junior and senior years where he worked as a Java developer implementing a wellbore analyzer plug-in for Landmark. This tool was presented at the SEG annual meeting 2012 held in Las Vegas. During his second internship, following his graduation from Mines, Elias worked in the Quantitative Interpretation (QI) group at BHP Billiton, creating rock physics templates for seismic data evaluation. He joins CWP under the guidance of Prof. Dave Hale.

Elias' hobbies include: staying physically fit, being outdoors, spending time with friends and family, and supporting Mines' athletics on the schools cheer team.

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**Yogesh ARORA**

Degree Program: PhD, Geophysics  
Country: India

In 2013, Yogesh graduated from the Indian School of Mines, Dhanbad, with his Bachelor and Master of Science degrees in Applied Geophysics via a five-year program. He completed his Master’s thesis with the Gas Hydrate research group of the National Institute of Oceanography, Goa. For his Master’s thesis, he estimated P-wave anisotropic parameters in orthotropic media containing two sets of mutually orthogonal fractures in isotropic background. This model aims to resemble the Gas Hydrate occurrences in Krishna-Godavari (KG) basin located in southern India.

His CWP advisor is Prof. Ilya Tsvankin. Yogesh's research interest are Seismic Anisotropy, Seismic Imaging and Inversion.

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**Tong BAI**

Degree Program: PhD, Geophysics  
Country: China

Tong received his Bachelor of Engineering degree in Geophysics from China University of Petroleum (Beijing). In graduate school, he switched his major to petroleum geology, focusing on the migration path of tight sand gas in China’s Western Sichuan province. His research interest also includes the distribution and attributes of fractures.

Tong joined CWP in August 2013, under the guidance of his advisor, Prof. Ilya Tsvankin. He enjoys sports, especially tennis, soccer, and badminton.

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**Mihai BARBU**

Degree Program: MS, Geophysics  
Country: Romania

Mihai received his bachelor of science degree in Geology and Geophysics from the University of Bucharest, Romania in 2013. His bachelor's thesis was titled "Evaluation of the Q factor in the inner core, using earthquakes from Fiji, recorded at European seismological networks." He has also done some research in gravimetric modeling using the finite difference method. His CWP advisor is Prof. Paul Sava.

Mihai loves observational astronomy, mountaineering and swimming.
Farhad BAZARGANI
Degree Program: PhD, Geophysics
Country: USA

Farhad received his Bachelor of Science degree in physics and Master of Science degree in geophysics from the University of Tehran. After graduation, Farhad worked for a few years as a geophysicist with WesternGeco and PGS Inc. He then decided to continue his studies at CWP at the Colorado School of Mines. Farhad's CWP advisor is Prof. Roel Snieder. He enjoys classical music, philosophy, programming, playing the violin, and swimming.

Esteban DÍAZ PANTIN
Degree Program: PhD, Geophysics
Country: Venezuela

Esteban is a geophysical engineer who graduated from Universidad Simón Bolívar (USB) in Caracas Venezuela, in 2008. After graduation, Esteban worked in seismic data processing and depth imaging with 3DGeo South America/Stratageo and later, GeolImaging Solutions (GIS). In 2010, he joined the R&D group of GIS and worked on full waveform inversion (FWI). Esteban joined CWP in Fall 2011. Prof. Paul Sava is his advisor. During his time at CWP, Esteban has worked on Migration Velocity Analysis using two-way operators. Using this kind of propagators allows the use of the kinematic information contained in diving waves and backscattered waves (commonly regarded as noise). This extra information can better constrain the long wavelength components of the model. Outside geophysics, Esteban enjoys playing tennis, soccer, skiing and exploring Colorado.

Johannes DOUMA
Degree Program: MS, Geophysics
Country: The Netherlands

Johannes is a graduate student in Geophysics at the Colorado School of Mines. His strong interest in wave phenomena research led him to join the Center for Wave Phenomena. Johannes' advisor is Prof. Roel Snieder. He completed a project to optimize time reversal focusing through deconvolution for acoustic waves with Prof. Snieder and Los Alamos National Laboratory researchers TJ Ulrich and Brian E. Anderson. Additionally, he recently worked together with visiting researcher Dr. Ernst Niederleithinger on applying his method to a concrete block with embedded receivers at the civil engineering lab in Mines. He then began working on improving the locating of microseismic events. This work has been completed for both the acoustic case as well as the elastic case. During the summers of 2012 and 2013, he worked at Cimarex Energy in Tulsa, Oklahoma under Dr. Steven L. Roche. Johannes worked in the exploration technology team. During his internships, he developed a new seismic attribute, a workflow to predict reservoir rock quality and potential EUR using seismic data, developing better elastic inversion for unconventional plays in order to high grade areas. Additionally, he worked closely with the Oklahoma team to assess and high grade new acreage. During his time, he worked on the data for the Permian, Mid-continent, and Cana region. One of his main focuses now is building better low frequency models to be used for inversions. He combined his work from the Cimarex internships with visiting researcher Ehsan Naeini to publish a paper on using image guided interpolation to build better low frequency models for inversions.

Yuting DUAN
Degree Program: PhD, Geophysics
Country: China

Yuting received her Bachelor of Science and Master of Science degrees in 2010 and 2012, respectively, from the School of Earth and Space Sciences at Peking University in Peking, China. Her Master's thesis was titled, "ADPI elastic wave forward modeling based on high performance computing." She is currently working with Prof. Paul Sava, her CWP advisor. Yuting loves to take part in a variety of activities; her favorites being swimming and traveling.
**Chris GRAZIANO**

Degree Program: MS, Geophysics  
Country: USA

Chris graduated from the Colorado School of Mines with a Bachelor’s degree in geophysics and a minor in geology. During this time, he interned with Transform Software and Services where he worked with the support staff and programmed with the development team. He also interned with Sigma Cubed, which gave him the opportunity to analyze and interpret a channel sands reservoir and propose new locations to drill. Chris joined CWP in Fall 2013 to work with Prof. Dave Hale, his advisor.

During his free time, Chris wood carves caricatures by hand and loves to workout and run.

**Detchai (Pock) ITTHARAT**

Degree Program: MS, Geophysics  
Country: Thailand

Pock is originally from Bangkok, Thailand. Last summer, he worked with Prof. Paul Sava on the “Foundations of Radar and Seismic Imaging of Asteroids and Comets,” and with the Southwest Research Institute in Boulder, Colorado. His main research interest is seismic imaging, on which he is currently working and studying at CWP. He participated in the CSM Department of Geophysics Field Camp during the summer of 2012, where he conducted geophysical field investigations at Pagosa Springs, Colorado. At Mines, he is currently taking course work that includes: Intro to seismology, wave seismic imaging, and advanced seismic processing, where he regularly uses Madacascar, Java, Seismic Unix (SU), etc. Apart from his academics, Pock is a residential assistant at Maple Hall, a dormitory at Mines. He loves outdoor recreation and he plays classical guitar.

**Oscar JARILLO MICHEL**

Degree Program: MS, Geophysics  
Country: Mexico

Oscar graduated from Instituto Politécnico Nacional, México, in 2010 with a Bachelor of Science degree in geophysical engineering. In August 2010, while an undergraduate, he participated in the Society of Exploration Geophysicists (SEG)’s 3rd Latin American Challenge Bowl held in Manizales, Colombia. In November 2010, he also took part in the 1st Contest of Earth Sciences Knowledge during the 50th anniversary of the Union Geofísica Mexicana (UGM). Oscar is currently working on FWI for VTI media to estimate source and anisotropy parameters from microseismic data. His CWP advisor is Prof. Ilya Tsvankin. Oscar uses full-waveform modeling for dislocation-type sources to simulate microseismic events and implements the adjoint-state method to estimate source location, source mechanism, and VTI parameters.

**Nishant KAMATH**

Degree Program: PhD, Geophysics  
Country: India

Nishant received his Bachelor’s and Master of Science degrees in geophysics at the Indian Institute of Technology-Kharagpur in 2008. He worked as an On Board Processor for WesternGeco for two years before starting graduate studies at CSM with a minor in mathematics. He is currently working on FWI for 2D VTI media to estimate vertical velocities and anisotropy parameters. Nishant interned with Shell International Exploration and Production, in Houston, Texas, in the summer of 2012. The work involved testing various parameters for serial- and joint-inversion (FWI) of acoustic (OBN) data and analysing the tradeoff between inversion parameters. Nishant is working on Full-waveform Inversion (FWI) for 2D VTI media. He works on the adjoint state method to estimate Thomsen parameters (vertical P- and S-wave velocities, epsilon and delta). His advisor is Prof. Ilya Tsvankin. His hobbies are hiking, reading, playing tennis and experimenting in the kitchen.
Chinaemem KANU
Degree Program: PhD, Geophysics
Country: Nigeria

Kanu received his Bachelor of Science degree in physics from Michael Okpara University of Agriculture in Nigeria. He then earned a post-graduate diploma in earth system physics at the International Center for Theoretical Physics (ICTP) in Italy. In 2008, Kanu began work on his Master of Science degree in geophysics at Indiana University, Bloomington. His research focused on modeling the creep response of the Southern Hayward Fault to the 1989 Loma Prieta earthquake on the San Andreas Fault. His current research interests are in monitoring time-lapse changes in sub-surface reservoirs and microseismicity. He is currently working with Prof. Roel Snieder at CWP. Apart from research, Kanu gets involved in outdoor sports and enjoys exploring the beautiful mountains in Colorado.

Allison KNAAK
Degree Program: PhD, Geophysics
Country: USA

Ali earned a Bachelor of Science degree in physics and mathematics from Presbyterian College in Clinton, South Carolina in 2010. She is working at CWP with Professor Roel Snieder on applying synthetic aperture to controlled-source electromagnetic (CSEM) data. Ali is also collaborating with Professor Jen Schneider in the Liberal Arts and International Studies (LAIS) department for her minor on topics concerning communication and context of geophysics. Ali's academic interests are in improving CSEM, communicating science, mathematics, and physics. Her hobbies are road biking, hiking, playing disc golf, reading and volunteering at the local animal shelter. She loves working, playing, and living near the mountains.

Vladimir LI
Degree Program: PhD, Geophysics
Country: Russia

Vladimir received his Bachelor of Science and Master of Science degrees in geophysics from Lomonosov Moscow State University (LMSU). During his studies, he acquired and processed shallow seismic data in the Shallow Seismic Group at the Department of Seismics and Geoaoustics. As an undergraduate student at LMSU, he received the ConocoPhillips Excellence in Education Award for the 2007-08 academic year. He joined CWP in August 2012 and his advisor is Prof. Ilya Tsvankin. Vladimir enjoys reading classic literature, listening to music (mostly Russian rock), playing chess, Preferans, table tennis, football and billiards. Vladimir was the former Moscow State University student chess champion.

Simon LUO
Degree Program: PhD, Geophysics
Country: USA

Simon graduated from the University of California, Berkeley, with a Bachelor's degree in physics. He joined CWP in August 2009 and is working with Prof. Dave Hale. His research interests include seismic image processing, seismic migration and inversion, and geophysical computing. He interned at Transform Software in Littleton, Colorado, and at Chevron Energy Technology Company in San Ramon, California.
Andrew MUÑOZ

Degree Program: PhD, Geophysics  
Country: USA

Andrew graduated from Texas A&M University in December 2010 with a Bachelor of Science degree in geophysics. While at Texas A&M, Andrew participated in undergraduate research involving potential field geophysics and three-dimensional tsunami modeling using GPUs. He held an internship with Devon Energy and two internships with Newfield Exploration as a geophysicist. Andrew accepted a full-time offer to work at Newfield Exploration as a geophysicist upon completion of his Master's degree at the Colorado School of Mines. Andrew’s hobbies include: running, swimming, cycling, ultimate frisbee, hiking, snowboarding, and cooking.

Natalya PATRIKEEVA

Degree Program: MS, Geophysics  
Country: Russia

Natalya graduated with a BS in earth science from Rice University in Houston, Texas, in May 2012. She is working with Profs. Ilya Tsvankin and Paul Sava at CWP. Her scientific interests range from seismic imaging in complex environments, tomography, numerical methods, field work, energy policy and education. Natalya's research is focused on Poynting vector based angle gather construction and comparison of the direction based and extended imaging condition angle decomposition methods. Outside of work, Natalya enjoys yoga, running, going to arts museums and theater, sailing, snowboarding, drawing, travelling, as well as reading Russian literature and science-fiction.

Satyan SINGH

Degree Program: PhD, Geophysics  
Country: Trinidad and Tobago

Satyan graduated from the University of West Indies in 2008, with a Bachelor of Science degree in petroleum geosciences. While an undergraduate, he had a summer internship with BP Trinidad and Tobago, which was followed by his employment as an exploration geophysicist at BG Group Trinidad and Tobago. After one year of employment in the oil and gas industry, he decided to pursue a Master of Science degree in geophysics at Texas A&M University. Satyan joined CWP in August 2011 and his advisor is Prof. Roel Snieder. His current interest is retrieving the Green's function and imaging. Apart from academic research, Satyan enjoys playing table tennis, cricket and football.

Loralee WHEELER

Degree Program: MS, Geophysics  
Country: USA

Loralee graduated from Colorado School of Mines with a Bachelor's degree in geophysical engineering. She joined CWP in the Fall 2013 to work with Prof. Dave Hale, her advisor. For the past two summers, Loralee interned with Chevron in Houston, Texas. In 2012, she worked in the Petrotechnical Data Management team transferring 2D/3D seismic data to Chevron's new software package as well as providing software support for seismic data transfer issues. In 2013, she worked in the Amplitude and Custom Processing team testing the effects of post migration data conditioning on simultaneous inversion quality. She updated the PMDC processing flow to decrease processing time while maintaining maximum inversion quality. During her free time, Loralee enjoys photography, urban exploration, zumba, and upcycling.
Xinming WU

Degree Program: PhD, Geophysics
Country: China

Xinming received a Bachelor of Engineering degree in 2009 in Geophysics from Central South University, Changsha, China. He earned a Master of Science degree in 2012 in Geophysics from Tongji University, Shanghai, China. During his master-degree thesis work, he developed a phase unwrapping method with horizon and unconformity constraints to generate a reliable RGT (Relative Geologic Time) volume, based on which a seismic Wheeler volume was automatically obtained. Xinming joined CWP in August 2012 and is working with Prof. Dave Hale. He is currently working on horizon volume with constraints and 3D seismic image processing for unconformities. His research interests focus on numerical methods for seismic interpretation. Xinming enjoys traveling, watching movies, reading and writing.
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