

WOMEN OF NILE 2018

NIF&PS



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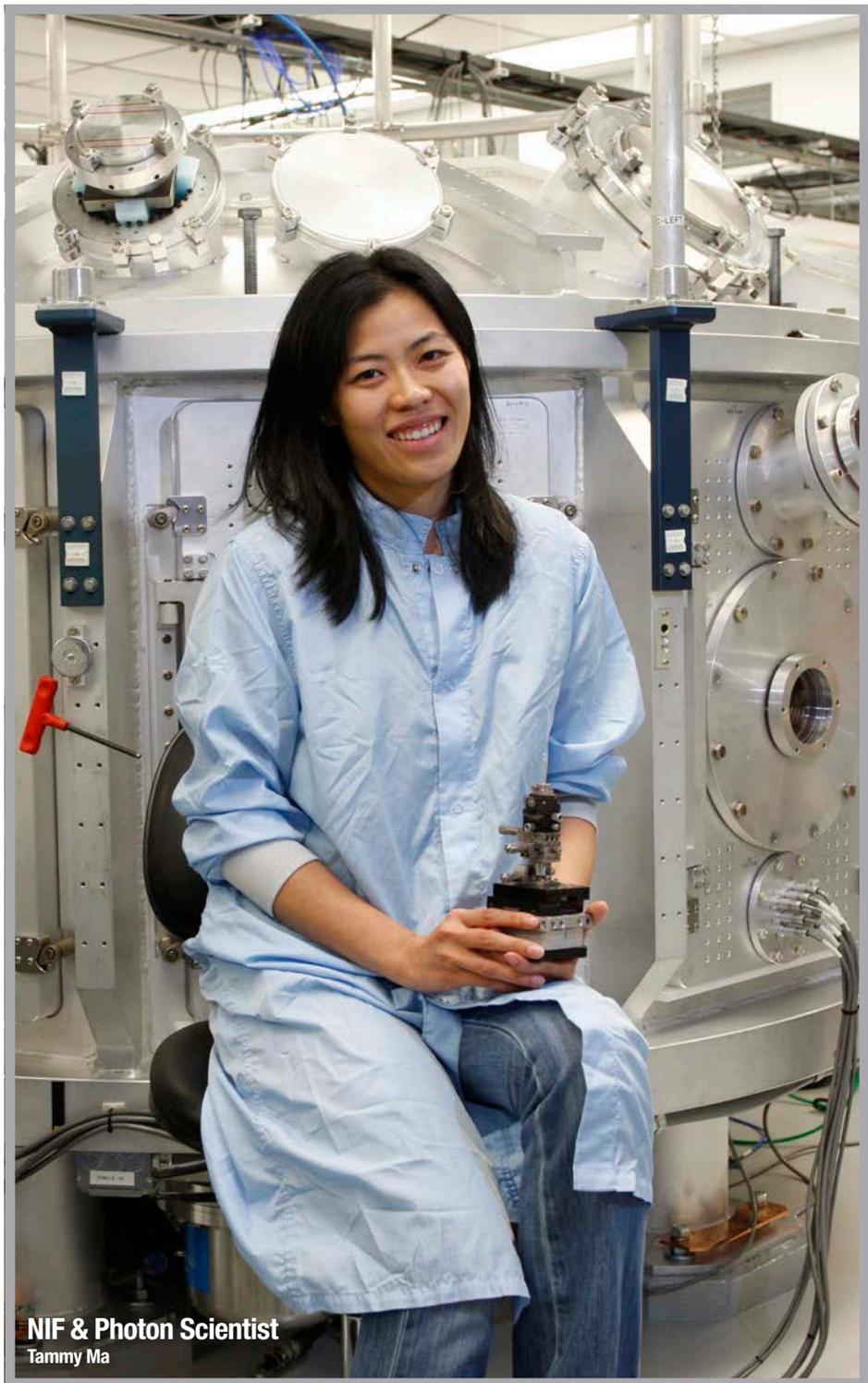
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The Talented and Dedicated Women of NIF&PS

Among the missions of the NIF and Photon Science (NIF&PS) Directorate at Lawrence Livermore National Laboratory is operating the National Ignition Facility (NIF), the world's largest and highest-energy laser system. It takes a technical staff with a wide variety of expertise and experience to support operating NIF as a user facility and to develop and carry out a preeminent experimental program in high-energy-density science on NIF. Likewise, it takes a technical staff with a wide variety of expertise and experience to support other activities of the NIF&PS Directorate, where innovation and the development of critical technologies are key to advancing the state of the art in laser science – technical staff such as the women profiled in this brochure.

The skills of the women of NIF&PS range from chemistry (inorganic, organic, physical and nuclear), physics (applied, astro, experimental, nuclear, and plasma), and biology to engineering (aeronautical, chemical, electrical, mechanical, optical, and nuclear), material science, microscale fabrication, applied mathematics, statistics, computer science, information technology, and robotics. Their backgrounds and interests are equally varied. In this brochure, you will meet just a few of the talented and dedicated professional women without whom our success would not be possible. While the brochure focuses on the Directorate's scientists and engineers, the contributions of many other women working at NIF&PS, including technicians, analysts, designers, and administrative personnel, are equally vital to accomplishing our important missions: helping ensure the nation's security and continued scientific leadership, and furthering the pursuit of a clean, safe, and virtually inexhaustible source of energy.



NIF & Photon Scientist
Tammy Ma



**Félicie
Albert**
Experimental Physicist

Dr. Félicie Albert is an experimental physicist for the National Ignition Facility and Photon Science Directorate at Lawrence Livermore National Laboratory (LLNL). She earned her bachelor's degree in optical engineering from the Ecole Nationale Supérieure de Physique de Marseille in France, her MS in optics from the University of Central Florida and her PhD in physics from the Ecole Polytechnique in France in 2007.

Félicie combined the love of astronomy she has had since her childhood with her natural scientific curiosity and decided to study optics and lasers in college.

In early 2008, Félicie was hired as a post-doctoral researcher at LLNL and became a permanent member of the scientific staff in 2010. Since joining LLNL, Félicie has conducted many experiments and led several projects using high-intensity lasers. Her expertise in this area has allowed her to generate novel sources of particles, x-rays and gamma rays using lasers for applications in high energy density sciences, homeland security, medicine, biology and industry.

Favorites and noteworthy

- Favorite subjects in high school: Physics and Sports
- Favorite subjects in college: Optics and plasma physics
- Noteworthy accomplishments: Winner of LLNL's best postdoc publication in 2011, APS Outstanding Referee in 2015, DOE Early Career Research Program Award in 2016, APS Katherine E. Weimer Award in 2017, Edouard Fabre Prize in 2017.



**Lisa
Belk**

Lead, NIF Computing Division

Lisa Belk leads the NIF Computing Division, which is responsible for writing the software that operates and analyzes results from the world's largest laser. Starting at LLNL in 2002, she worked her first ten years in various roles within the NIF & Photon Science (NIF&PS) Directorate, including managing software development teams and serving as a work control officer during NIF's construction phase. From 2012 to 2016, she worked as the Global Security Directorate's Information Technology Manager and also led software verification projects for the Department of Homeland Security's counterterrorism program. She returned to NIF&PS in 2016 to lead the NIF Computing Division and enhance the classified computing capabilities for new laser projects in support of national defense missions. She earned her B.A. in economics from the University of California San Diego and her M.B.A. in management information systems from the University of Notre Dame.

Favorites and noteworthy

- Favorite subjects in school: High school yearbook editor, high school valedictorian, worked as a web master during college for UCSD and University of Notre Dame
- Noteworthy accomplishments: Featured in Diablo Magazine's 2016 Forty Under Forty List for the San Francisco East Bay



**Rita
Bettenhausen**
Computer Scientist

As the youngest of twelve children, Rita Bettenhausen never expected to go to college. However, she won a small scholarship from a woman's club that paid for community college, where she studied secretarial science and earned an AAS degree. She began work at Bethlehem Steel as a secretary for the Management Information Systems group. There, she was introduced to computers, which led her to begin night classes studying math. This in turn led to her earning a BS in electrical engineering from Penn State.

Throughout her career Rita focused mainly on Control and Monitoring systems both before she came to LLNL (automation of a steel rolling mill and a semiconductor processing line) and after (Atomic Vapor Laser Isotope Separation [AVLIS] vapor monitoring and NIF controls). During her time working for NIF, she designed the controls hardware for the plasma electrode Pockels cell (PEPC). More recently, she designed and implemented an automated, data driven system that analyzes the target diagnostic data collected on NIF experiments.



**Rebecca
Butlin**

NIF Target Fabrication
Production Manager

Becky Butlin is a mechanical engineer and is currently the NIF Target Fabrication production manager at Lawrence Livermore National Laboratory (LLNL). She earned her BS degree in mechanical engineering from Cal Poly San Luis Obispo in 2003 and soon after began her career at LLNL. She then earned her MS degree in mechanical engineering from UC Davis while working at LLNL.

At Cal Poly, she received the Academic Achievement Award for graduating at the top of her engineering class. As a natural leader, she often led class projects, Bible studies, and work projects, as well as mentoring and teaching others.

Throughout college and her early career, Becky focused on engineering design and analysis. It wasn't until she was asked to manage an assembly team that she found her affinity for production management and continual process improvements.

Favorites and noteworthy

- Favorite subjects in high school: Art, trigonometry, calculus, and physics
- Favorite subjects in college: Statics, dynamics, and mechanical design
- Noteworthy accomplishments: Successfully leading the assembly team for over 600 large optical assemblies for NIF. Successfully leading the NIF Target Assembly team.



**Debra
Callahan**
Physicist

Dr. Debra Callahan is a physicist and group leader in the Weapons and Complex Integration organization at LLNL. She leads the Hohlräum System Integration working group within the National Ignition Campaign. She received her BS degree in physics and mathematics from the University of Denver in 1985. She spent two years at Cornell University before moving to LLNL to finish her PhD at the University of California, Davis, in 1993.

Debra has spent her career at LLNL working on ICF and inertial fusion energy (IFE). In 2004, she switched from heavy-ion-driven IFE target design to NIF target design. Her specialty is the physics and design of hohlraums for inertial confinement fusion (ICF) targets. Her ignition hohlraum design has been the basis for the hohlraum shots on NIF since 2009.

She is currently serving on the Executive Committee of the American Physical Society Division of Plasma Physics and has been active in promoting women in plasma physics.



Lydia Carmara
NIF&PS Deputy Principal
Associate Director
for Operations

Lydia Camara is NIF&PS Deputy Principal Associate Director for Operations. Directorate Operations provides information technology, facilities management, environment, safety, and health, training, security, assurance, and project / construction management services to the Directorate. Lydia came to the Laboratory in 2003 and has held positions in the NIF&PS Directorate as the Deputy Operations Manager, assurance manager, and Directorate security officer. She received her B.S. in biochemistry from Virginia Tech and her MBA from Saint Mary's College of California.

Favorites and noteworthy

- Favorite subjects in school: Chemistry
- Noteworthy accomplishments: Currently responsible for implementing the enhanced work control system in the NIF&PS Directorate.



**Kim
Casey**

NIF & Photon Science
Directorate Administrator

Kim Casey is the NIF & Photon Science directorate administrator at Lawrence Livermore National Laboratory (LLNL). She is a key member of the senior management team, providing administrative leadership, direction, and oversight of all administrative and personnel operations. She serves as the representative to Human Resources on decisions involving recruitment and hiring, performance and salary management, internal communications, and personnel policies. She manages the staffing and workforce planning activities for the directorate and is responsible for directorate operational and administrative procedures. She oversees and coordinates a myriad of directorate-wide activities and represents NIF&PS on Laboratory working groups and institutional committees as needed.

Kim started at LLNL in 1997 as a program secretary in the Laser Science & Technology Program of the Lasers Directorate. She has held positions of increasing responsibility across the Laboratory, first as associate administrator, then division administrator, and lastly as a department administrator. In 2014, Kim was selected for her current role as directorate administrator. Prior to coming to LLNL, Kim worked as a program analyst for the Department of Energy. Kim holds a management certificate from the University of the Pacific.

Favorites and noteworthy

- Favorite subjects in high school: French and she was active in sports and other activities.
- Noteworthy accomplishments: She has been working since age 15 and credits her success and achievements to a lot of hard work, diligence, and not being afraid to take advantage of opportunities presented to her.



**Cathy
Chang**

Software Quality
Assurance Engineer

Cathy Chang is a Software Quality Assurance Engineer for the National Ignition Facility at Lawrence Livermore National Laboratory (LLNL). She earned her BS degree in Environmental Toxicology from the University of California, Davis (UCD), her BS degree in Computer Science from San Jose State University (SJSU) and her MS degree in Computer Science from California State University, Hayward.

Cathy was born in Hong Kong. Her family immigrated to the United States when she was 7 in hopes of getting a better education. Knowing very little English, she could only excel in Math. She did not attend a regular English class until 7th grade.

After graduating from UCD, she worked 4 years as a chemist. While studying at SJSU, she worked as an intern at ELetter, Inc. Her QA Manager encouraged and mentored her to go into software testing, and she stayed in that field ever since. She began working at LLNL in July 2004 and continues to test web and standalone applications to this day.

Favorites and noteworthy

- Favorite subjects in high school: Calculus, Home Economics
- Favorite subjects in college: Food Toxicology, Combinatorics
- Noteworthy accomplishments: Fluent in Cantonese and English. Scored 5 in A.P. Calculus. Built a computer. Fixed things around the house. Completed numerous sewing/knitting/crochet projects.



**Yiping
Chen**
Computer Scientist

Yiping Chen currently works on software design and development for the Integrated Computer Control System (ICCS) Graphical User Interface (GUI) and Maintenance and Commissioning Tools. After graduating from the Illinois Institute of Technology (IIT) Graduate College in 1991, she worked for several software companies as senior/lead developer to design and develop commercial software products.

She began working at LLNL in 2004 as part of NIF Controls and Information Systems group, where she was responsible for Campaign Manager software design and development. Previously, she worked as an assistant professor in the Electrical Engineering Department of Fuzhou University in China.

Favorites and noteworthy

- Favorite subjects in high school: Mathematics and physics
- Favorite subjects in college: Electrical engineering and computer science.



Marina Chiarappa-Zucca
Biologist/Chemist

Marina Chiarappa-Zucca is a biologist/chemist for the National Ignition Facility and Photon Science Directorate at Lawrence Livermore National Laboratory (LLNL). She earned her B.A. degree in biology from U.C., Davis, and her MS degree in marine biology from the University of Alabama in Birmingham.

Marina worked at the University of Wisconsin on research in environmental toxicology. She has been at the LLNL for 25 years. Most of her career has been dedicated to doing research using her analytical chemistry and biology skills to solve problems in the areas of environmental remediation and biodefense. At NIF, she applies her expertise to issues related to tritium and beryllium and operates the mass spectrometer that is used to determine the gas composition for ignition laser shots.

Favorites and noteworthy

- Favorite subject in high school: Biology
- Favorite subject in college: Invertebrate zoology
- Noteworthy accomplishments: Teaching Environmental Science and Field Research Techniques at De Anza College as adjunct faculty; Receiving the LLNL Director's Performance Award for providing novel technologies for remediating a superfund site.



**Raelyn
Clark**
Computer Scientist

Raelyn Clark is the team lead for the Production Optics Reporting and Tracking (PORT) tool and the database architect for the Optics Inspection (OI) Analysis team, supporting the National Ignition Facility and Photon Science Directorate. She earned a BS in computer science from Duquesne University in Pittsburgh.

Raelyn came to LLNL in 2001 as a member of the formal test Verification and Validation team, responsible for testing software changes and updating requirements specifications. She transitioned to providing data management support for on-going development, test and production activities.

In her current position she is responsible for the full product lifecycle in PORT and OI, including database design, configuration maintenance, release schedule/installation, and data management. She enjoys interacting, brainstorming, and problem-solving with program management, engineers, scientists and developers.

She received an Air Force ROTC college scholarship, and served in the military for eight years. As a member of both U.S. and A.F. Space Commands, she was responsible for planning satellite and space shuttle launches, as well as monitoring satellite positions in space.

Favorites and noteworthy

- Favorite subjects in high school: Accounting and Computers
- Favorite subject in college: Database design
- Noteworthy accomplishments: Proud wife and mother of two boys; Serving in the military; Introducing new methods for organizing data and adding configuration management to the systems she works on.



**Pascale
Di Nicola**
Physicist

Pascale Di Nicola is in charge of the NIF pointing working group as the Responsible Individual for the NIF pointing performance and is also a core member of the Target & Laser Interaction Sphere (TaLIS) group. She also supports Operations on activities relative to target and beam alignment to Target Chamber Center. In 1995, she earned her MS in solid state physics and chemical engineering at the Institute of the Sciences of Matter and Radiation and at the National Superior Engineering School, Caen University, France. The same year, she also earned a Diploma of Advanced Studies in Solid State Physics, Caen University, France.

Over her career, Pascale has held a variety of key positions in the semiconductor industry. She fabricated, assembled or metrologized targets for experiments conducted on five different large laser facilities from CEA, Laboratoire d'Utilisation des Laser Intenses (LULI), Laboratory for Laser Energetics (LLE) University of Rochester and Lawrence Livermore National Laboratory (LLNL). After taking part in the first system shot to Target Chamber Center as an Invited Scientist in 2008, Pascale was hired by LLNL in 2009 to work on NIF.

Favorites and noteworthy

- Favorite subjects in high school: Science, math and foreign languages (German and English)
- Favorite subject in college: Solid state physics.



**Pamela
Divoky**

Assurance Manager in the
NIF&PS Directorate

Pamela Divoky is the Security and Project Integration Manager in the NIF&PS Principal Directorate. Previous roles include assurance management and the management of various construction and demolition projects within the NIF&PS Principal Directorate. She earned her engineering degree from California State Polytechnic University in 1990 and is a certified Project Management Professional.

After graduation, Pamela initially worked as an environmental engineer and manager and then transitioned into facility engineering and construction in various high tech companies located in the Bay Area as a Project Manager

Pamela has developed a real-time application for total metals analysis for wastewater treatment system at a high tech wafer fabrication facility and managed construction projects to remove and dismantle unique legacy equipment and structures within the NIF Directorate.

Favorites and noteworthy

- Favorite subjects in high school: Math and Physics
- Favorite subjects in college: Operations Research Planning and Control, Facility Layout and Design
- Noteworthy accomplishments: Developed real-time application for total metals analysis for waste water treatment system. Managed construction projects to remove unique legacy equipment and structures within NIF. Presenter for LLNL's Fun with Science program



**Rebecca
Dylla Spears**
Chemical Engineer

During high school, she enjoyed math, science, foreign language and physical education. She was always excited about the assignments that involved experiments in science. While a Senior in high school, she participated in the tutoring program where she mentored the Sophomores and Freshman in science and realized she enjoyed the teaching aspect of it.

As a chemical engineer at LLNL, Rebecca supports the study and growth of cryogenic hydrogen fuel layers in ignition targets for the NIF. She also studies colloidal particle interactions in solution as they pertain to optical polishing. Early in her career, Rebecca supported efforts to rapidly grow large, potassium dihydrogen phosphate crystals for NIF optics.

Favorites and noteworthy

- Favorite subjects in high school: Chemistry, mathematics and literature
- Favorite subjects in college: Transport phenomena, chemistry, and literature
- Noteworthy accomplishments: NSF Graduate Research Fellowship recipient, mom, five-time marathon finisher.



**Kangmei
Gu**
Computer Scientist

Kangmei Gu works for the NIF Database team, supporting the area of Integrated Computers and Controls configuration, shot modeling and target diagnostics. She grew up in Shanghai, China. After graduating from college there in 1988, she went to Canada to pursue a MS degree in physics from the University of Montreal, with a full scholarship.

Kangmei moved to the U.S. in 1995 and worked as a process engineer, software engineer, and software quality assurance engineer for various companies in the Bay Area. She began working at LLNL in 2003 as part of the NIF Verification and Validation team. She was responsible for fully integrated shot testing for eight years.

Favorites and noteworthy

- Favorite subjects in high school: Math and Chemistry
- Favorite subject in college: Solid State Physics
- Noteworthy accomplishments: Developed the automation software for GaAs poly synthesis weighing station, improving poly crystal growth yield from 70% to 90%. Developed automation software for optical inspection equipment for the disk drive industry.



**Gayatri
Gururangan**
Systems Engineer

Gayatri Gururangan is a Systems Engineer and an expert group leader responsible for assessing the safety of shots being proposed on the National Ignition Facility at Lawrence Livermore National Laboratory.

She has been interested in solving math and logic puzzles from a very young age, so a position that involved statistical/mathematical modeling and analysis was the perfect career choice.

Gayatri worked in industry on multiple projects that involved simulation, modeling, and forecasting before joining the Laboratory. She has worked on many challenging projects in the National Ignition Facility and Photon Science Directorate for the last 15 years.

Favorites and noteworthy

- Favorite subjects in high school: mathematics, statistics, physics, and music
- Favorite subject in college: statistics and computer science
- Noteworthy accomplishments: Implemented and improved many processes



**Denise
Hinkel**

Group Leader, Plasma Theory

Dr. Denise Hinkel is the group leader for the Plasma Theory group in the Weapons and Complex Integration (WCI) Directorate at LLNL. She received her PhD in physics in 1990 from the University of California, Los Angeles. She began her career at LLNL in 1992 as a postdoctoral physicist in X Division.

Over the years, Denise has been a major contributor to the NIF effort, both as a plasma theoretician and as a target physicist for inertial confinement fusion and high-energy-density (HED) science. In addition to her contributions in these areas, she also has served for several years as the WCI point of contact, managing the directorate's Laboratory Directed Research and Development portfolio.

Denise has been active in student outreach at Princeton and serves as a mentor in the HED Summer Student Program at LLNL. She is an active member of the American Physical Society and was named a fellow in 2008.



Laura Hopkins
Design Physicist

In June 2012, Dr. Laura Hopkins joined LLNL as a design physicist with WCI/AX Division and the National Ignition Facility and has been working on laser pulse and target designs for a variety of experiments on the NIF, including shock timing keyhole targets, the High Foot Campaign, and the High Density Carbon Campaign. She earned a BA in chemistry and physics from Dartmouth College. For her graduate work at Princeton University, she worked on the Lithium Tokamak Experiment (LTX) at the Princeton Plasma Physics Laboratory, where she developed and fielded the system of magnetic diagnostics and was the chief tokamak operator.

After graduating with a PhD in plasma physics, Laura served as a Congressional Fellow in the U.S. House of Representatives and then the U.S. Senate. During this time, her portfolios ranged from topics in waste management regulations to arms control treaties. Laura also manages a science communication and outreach project called Why-Sci (www.why-sci.com), which seeks to build a forum for scientists to communicate their research to the public and for non-scientists to learn about ongoing research projects.

Favorites and noteworthy

- Favorite subjects in high school: Chemistry, physics, and literature
- Favorite subjects in college: Chemistry, physics, vertebrate zoology, and Egyptian art history
- Noteworthy accomplishments: NNSA Stewardship Science Graduate Fellow; APS mini-grant for Public Outreach recipient; Assistant Editor for APS Forum on Physics and Society newsletter.



Laura Kegelmeyer
Lead, NIF Optics
Inspection Analysis

Laura Kegelmeyer is the team lead and founder of the National Ignition Facility Optics Inspection Analysis. She earned her bachelor's degree in biomedical engineering and masters in electrical engineering from Boston University.

Laura first came to LLNL to study the physics of cells. During her dozen years with LLNL's biophysics program, she researched topics such as genetic abnormalities and DNA probe mapping. This expertise in biomedical image analysis brought her to NIF in 2000. Her automated inspection effort has extended its scope to include target and cryogenic fuel layer inspection to streamline analysis of, and eventually predict the quality of, the frozen fuel layers early in the crystal growth process.

She also enjoys synergistic teamwork and brainstorming. From her master's project to her 25 years at the Laboratory, she has worked with a number of teams and enjoys pulling together competencies to achieve a result.

Favorites and noteworthy

- Favorite subjects in high school: Qualitative analytical chemistry
- Favorite subjects in college: Electric Circuit Theory, Biomedical Engineering Senior Project (develop respiratory-impedance measuring device).
- Noteworthy accomplishments: Fundamental groundwork in computer-aided digital mammography. Automated optics inspection analysis for the high power NIF laser.



**Tanza
Lewis**

Shot Director for the
National Ignition Facility

Dr. Tanza Lewis is a shot director for the National Ignition Facility at Lawrence Livermore National Laboratory (LLNL). She earned a BS degree in chemistry and a PhD in physical chemistry from the University of California, Irvine.

During high school and college, Tanza focused on chemistry, physics, mathematics, and sports. She was nominated for athlete of the year at her high school and played Division 1 softball as a pitcher during her first year in college. While completing her doctorate, she did research at the BESSY synchrotron facility in Berlin, and her frequent trips to Berlin gave her an opportunity to travel much of Europe. Before completing her PhD, she earned the Nottingham Prize Award for her work in surface science.

After completing her PhD in 2011, Tanza began working at LLNL as part of the Cryogenic Layering team, where she was responsible for creating the deuterium-tritium ice layers for ignition laser shots. She then joined the team of shot directors and is responsible for successfully and safely executing the complex experiments in the NIF.

Favorites and noteworthy

- Favorite subjects in high school: Chemistry and physics
- Noteworthy accomplishments: NIF Operations Leadership Program 2012; Nottingham Prize Award Winner 2011; American Chemical Society Analytical Chemistry Award 2007.



**Tammy
Ma**
Physicist

Dr. Tammy Ma is a physicist in the National Ignition Facility and Photon Science Directorate's Inertial Confinement Fusion & High Energy Density Science Program at Lawrence Livermore National Laboratory (LLNL). She earned her BS degree in aerospace engineering from Caltech, and her MS and PhD from the University of California, San Diego.

In middle school and high school, Tammy was lucky to have great science teachers and became fascinated with exploring and understanding the world through science. Since then, she has dabbled in various types of research, from microbiology to 3D printers to spacecraft thrusters to high power lasers.

Following graduate school, Tammy completed a postdoc at LLNL before being converted to a staff scientist in 2012. Her research involves applying X-Ray Thomson scattering to characterize conditions of warm dense matter, as well as leading and executing experiments on the NIF, toward the primary goal of achieving thermonuclear burn and ignition. She currently leads the X-Ray Analysis group within the Inertial Confinement Fusion (ICF) Program.

Favorites and noteworthy

- Favorite subjects in high school: Physics, biology, and American history
- Favorite subjects in college: Spacecraft systems and plasma physics
- Noteworthy accomplishments: FY14 Director's Excellence in Publications Award; 2013 Defense Programs Award of Excellence; LLNL Lawrence Scholar Program Fellow



Anastacia Manuel
Optical Engineer

Dr. Stacie Manuel is currently working in the Optical Design and Engineering group. She earned her BS and ME in engineering physics from Cornell University, then joined LLNL to work on NIF after graduation. After several years at NIF, she worked briefly on a remote sensing project at LLNL before taking a leave of absence to go to graduate school at the College of Optical Sciences in Tucson, Arizona.

During graduate school, Stacie was a member of the Large Optics Fabrication and Testing research group. During the summers, she returned to LLNL to work on the Large Synoptic Survey Telescope (LSST). After receiving her PhD in Optical Engineering in December 2009, she again returned to continue working at NIF.

Favorites and noteworthy

- Favorite subjects in high school: Math, science and band
- Favorite subject in college: Optics.



**Kathleen
McCandless**
Computer Scientist

Kathleen McCandless is a computer scientist supporting the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory. She earned her B.A. in physics at Scripps College and earned the top senior thesis award for the physical sciences. While at Scripps, Kathleen also interned at the Stanford Linear Accelerator Center.

In 1998, she joined Lawrence Livermore National Laboratory working for the Weapons and Complex Integration directorate. She then returned to school and earned her masters in computer science from Stanford University in 2005 while working full time. She joined NIF in 2007 where she works with a multi-disciplinary team of scientists, continues to explore physics concepts and investigates new JavaScript-based web technologies.

Favorites and noteworthy

- Favorite subjects in high school: Calculus and Anatomy
- Favorite subjects in college: Computational Physics and Anthropology
- Noteworthy accomplishments: Earning Masters while working full-time and becoming a mother. Improving performance of the Virtual Beam Line (VBL) code and helping Laser Operations Performance Model (LPOM) group streamline their modeling capabilities.



Robin Miles

Project Engineer, Inertial Confinement Fusion Program

Robin Miles is a Project Engineer for the Inertial Confinement Fusion Program. She has a BS in mechanical engineering from the Massachusetts Institute of Technology, a MS in mechanical engineering from Stanford, and an MBA from the University of California at Berkeley.

While in high school in Lexington, Massachusetts, she took AP classes in calculus, chemistry and physics. She was always interested in science in school. Prior to coming to LLNL, she led product development teams for several Silicon Valley start-up companies. At LLNL, she was a group leader in the Micro and Nanotechnology Center working on micro-electro-mechanical systems (MEMS) devices for over 10 years before joining the Laser Inertial Fusion Energy team.

Favorites and noteworthy

- Favorite subjects in high school: Chemistry and physics
- Favorite subject in college: Engineering.



Sabrina Nagel

Post-Doctoral Researcher

Dr. Sabrina Nagel is a scientist at Lawrence Livermore National Laboratory. She is the responsible scientist for DIXI, a new fast x-ray framing camera for the National Ignition Facility (NIF) and regularly runs NIF shots for ICF and HED campaigns.

She began studying physics at the Julius-Maximilians-University in Wuerzburg, Germany. During her third year, she was awarded a fellowship to continue her studies at the University of Texas at Austin, where she received her M.A. in physics. In 2009, she earned her PhD from Imperial College London, where she studied short-pulse, high-intensity laser plasma interactions.

Sabrina started working at LLNL in 2011 as a post-doctoral researcher, and has been working on the Dilation X-ray Imager (DIXI), an x-ray framing camera for the NIF that can take images with an unprecedented temporal resolution. She regularly attends international conferences where she gives talks and represents LLNL.

Favorites and noteworthy

- Favorite subjects in high school: Math, English (as a foreign language), biology
- Favorite subject in college: Physics
- Noteworthy accomplishments: Received NIF&PS Award – “Outstanding support of DIXI characterization using Comet laser.”



Raluca Negres

Staff scientist in OMST group (optical materials science & technology)

Raluca Negres is a Staff Scientist in the Optical Materials, Science & Technology group within the NIF&PS Directorate. Since joining LLNL in 2004 as a Postdoctoral Researcher, she has conducted research in laser-matter interactions and optical material characterization for high-power laser applications. Raluca has provided technical leadership and made contributions to program efforts as the Principal Investigator on projects related to optics damage performance for the NIF and ARC laser systems. She received her Ph.D. in optical physics from the School of Optics/CREOL, University of Central Florida, Orlando, FL, and her B.Sc. in Physics from the University of Bucharest, Romania. Raluca is a member of the Optical Society of America and the program committee for the Boulder Laser Damage conference.

Favorites and noteworthy

- Favorite subjects in high school: math, physics, foreign languages (English, French, Latin)
- Noteworthy accomplishments: becoming a mother



**Hye-Sook
Park**
Experimental Physicist

Dr. Hye-Sook Park is an experimental physicist performing science experiments on NIF and many other laser facilities. She received her MS and PhD degrees in physics from the University of Michigan in 1985. Her thesis experiment was on extraterrestrial neutrino detection from the supernova 1987A explosion. Before joining the NIF, she was an astrophysicist searching for optical counterparts to gamma-ray bursts using automated triggered telescope systems.

At NIF, she developed a greater-than-15-keV, high-energy backlighter using short-pulse, high-intensity lasers with micro-flag- and micro-wire-style targets; this technique is now used for many experiments. She is now involved in developing a new class of high-energy-density science research on NIF, involving studies of materials under high pressure, radiation-hydrodynamic supernova Rayleigh–Taylor experiments, and collisionless shock experiments.

Favorites and noteworthy

- Noteworthy accomplishment: Dr. Park was named an American Physical Society fellow in 2010.

**Plasma Physics PhD
Physics MSci**



**Louisa
Pickworth**

Experimental Physicist
in X-Ray Science and
Measurement

Dr. Louisa Pickworth is a staff scientist working in the X-ray Diagnostics & Measurements group. She earned her undergraduate degree in physics at Imperial College London, England, in 2008 and stayed on at Imperial to earn her Ph.D. in plasma physics, working with the MAGPIE Z-pinch facility. Her thesis work focused on laboratory astrophysics experiments involving strong shocks produced by supersonic plasma jets. She joined LLNL as a postdoc in May 2013 and has worked on bringing imaging X-ray optic diagnostics to NIF for the study of inertial confinement fusion implosions. She became a staff scientist in October 2015. Louisa has worked on experimental projects to study the effects of cross-beam energy transfer on hohlraum radiation drive symmetry and the total hydrodynamic growth of the target capsule surface at high convergences.

Favorites and noteworthy

- Favorite subjects in school: Science, Art and History.



**Shahida
Rana**

Optical/Laser Scientist

Shahida Rana has been an Optical/Laser Scientist for NIF Directorate since 2001. She has 24 years of technical, industrial experience in optical engineering, project management, and quality assurance at NIF, Hewlett Packard Lab, Agilent Lab and Kaiser Electronics. She earned her MS in Optical Engineering/Optics and BS in Chemistry/Physics from the University of Arizona.

For most of her career at NIF, she has designed several NIF Diagnostic Optics such as SIDE Damage Inspection System, Input/Output Sensor Optics, and Target Alignment Calibration System. She has performed optical analysis/procurement of FODI, modeling/simulation of NIF Final Optics including stray light analysis. Participated and managed Management Readiness Assessment activities with NIF Readiness Assessment Manager.

Before coming to NIF, she has participated in US Navy, Army and DARPA sponsored research projects in a managerial/optics expert role. She has designed Reflective/Refractive Heads Up Displays for commercial and Navy/Military aircrafts (Boeing 747, F18, F16, and F14). She was technical advisor for Optics Design/Optical Coating, Optics Manufacturing, and Supplier Certification & Evaluation for many international Hewlett Packard divisions (Heptagon, Finland, Ipswich Components Operations, England, and Singapore) and Kaiser Electronic.

Favorites and noteworthy

- Favorite subjects in high school: Math, Science, Leadership
- Favorite subject in college: Optical Engineering, Modeling/ Simulation, Computer Programming
- Noteworthy accomplishments: Recipient of 10 U.S. Patents in Optical System Designs, Six Sigma Yellow Belt, NQA-1, and ISO 9001 Certified, Developed Record Management System tool for all research projects and identified iPad capabilities/NEO IWS Checklist for NIF Operation – Projected potential cost saving of 10% per employee.



Kathleen Schaffers
Chemist

Dr. Kathleen Schaffers is a chemist for the National Ignition Facility and Photon Science Directorate at Lawrence Livermore National Laboratory (LLNL). She earned her doctorate in inorganic chemistry/materials science from Oregon State University looking for and characterizing new laser materials that had not yet been discovered.

After receiving her doctorate, she performed 1-1/2 years of post-doctoral work at Stanford University where she concentrated on the growth of laser crystals. During this time, she was called by a colleague at LLNL for an interview in the area of crystal growth of new laser materials.

She has been at LLNL for 21 years and is a materials science expert in NIF. Her main focus is the research and fabrication of unique glasses and crystals for the NIF and other advanced lasers being built at LLNL.

Favorites and noteworthy

- Favorite subject in high school: Chemistry and Biology
- Favorite subjects in college: Materials science and Chemistry
- Noteworthy accomplishment: World's expert in the growth of Yb:S-FAP [Yb³⁺:Sr₅(PO₄)₃F] laser crystals.



**Marilyn
Schneider**
Experimental Physicist

Dr. Marilyn Schneider is an experimental physicist in the Physics Division of the Physical and Life Sciences Directorate at LLNL. She received her AB from Barnard College (Columbia University) with a major in physics and her PhD in physics from Cornell University in 1983.

As a postdoctoral candidate and research associate at Cornell University, she studied the fluctuations of the interface between two fluids near their critical point. She joined LLNL in 1986. At Livermore, she worked on commissioning SUV and VUV beamlines at the Stanford Synchrotron Radiation Lightsource. She studied interface instabilities at the Nova laser and used the LLNL Linear Electric Motor facility to study Rayleigh-Taylor instabilities between two fluids. During NIF commissioning, Dr. Schneider led the beam pointing working group.

Currently, she is continuing her x-ray source development work using short-pulse lasers. She participates in the NIF hohlraum working group, studying images of the laser entrance hole, and she is also part of the LLNL/Atomic Weapons Establishment collaboration fielding radiation transport experiments at the NIF.

Favorites and noteworthy

- Favorite subject in high school: Geometry
- Favorite subject in college: Quantum Mechanics
- Noteworthy Accomplishments: When my 3 daughters were in elementary school, I co-ran a program to teach students about famous multicultural artists and composers .



Marianne Shaieb
Computer Scientist

Marianne Shaieb is a computer scientist for the National Ignition Facility at Lawrence Livermore National Laboratory (LLNL.) She earned her BS from California State University, Chico.

After graduating from college, Marianne joined LLNL supporting the parts database for the Advanced Laser Isotope Separation (AVLIS) project. She then worked in several roles as team lead and project lead on the EPD Hazardous Waste Tracking System and on the Nuclear Chemistry team developing a Laboratory Information Management System (LIMS) for the tracking and analysis of hazardous and radiological analytical samples. Marianne joined NIF in 2006, working on the Integrated Computer Control System (ICCS) Database Team. She supports the configuration and archive databases and the ConfigEdit interface. She is currently the ICCS Database Schema Design Lead.

Favorites and noteworthy

- Favorite subjects in high school: Math, science, and leadership
- Favorite subjects in college: Computer Programming, database design, systems analysis & design
- Noteworthy accomplishments: Developed Chemistry's Sample Tracking, Analysis and Reporting System; Leading both projects and teams; Migrating ICCS ConfigEdit application to newer web-based technology.



**Dawn
Shaughnessy**

Deputy Program
Element Leader

Dr. Dawn Shaughnessy is the Group Leader of the Experimental Nuclear and Radiochemistry Group in the Nuclear and Chemical Sciences Division. In addition, she is the principal investigator on an LDRD-funded project, which focuses on the collection of refractory debris from NIF for stewardship-relevant measurements. She is part of a collaboration with UNLV and TAMU to investigate the chemical properties of the heaviest elements and has general research interests in nuclear reactions, radiochemical separations, and heavy element science.

Dawn received her BS in chemistry in 1993 and a PhD in nuclear chemistry from the University of California, Berkeley, in 2000. After completing a postdoctoral appointment at Lawrence Berkeley National Laboratory, she arrived at LLNL in 2002 as a staff chemist.

Honors received include being inducted into the Alameda County Women's Hall of Fame, LLNL Leadership Institute member, the Gordon Battelle Prize for Discovery of Element 117, Director's S&T Award for Radiochemistry at NIF, DOE Mentor Award, Global Security Leadership Development Program, the Chemistry, Materials, and Life Sciences Leadership Development Program; NNSA/Defense Programs Award of Excellence; Chemical and Materials Science Directorate Exceptional Service Award; and two Chemistry and Materials Science Directorate Certificate of Achievement.



**Mary
Spaeth**
Chief Technical Officer

Mary Spaeth is now a Visiting Scientist for the National Ignition Facility and Photon Science Directorate at Lawrence Livermore National Laboratory (LLNL). She earned her MS degree in nuclear physics at Wayne State University in 1962.

She began her career as a physicist at Hughes Aircraft Company, where she developed the first brassboard laser range finder and invented tunable dye lasers. From 1975 to 1990, she was a physicist, manager/program leader of the Lawrence Livermore National Laboratory Atomic Vapor Laser Isotope Separation (AVLIS) program, in charge of laser system development and systems engineering.

Mary has fifteen years of experience in NIF, as the Lead Systems Engineer, the Chief Technical Officer, and now as a Visiting Scientist. During these years, Mary took the lead for developing and implementing the Optics Recycle Loop. Spanning her career, she has fifty-four years of experience in the design, technical integration, and fabrication of large laser systems.



**Pamela
Spears**

Document Services
Group Leader

Pam Spears, a Group Leader with LLNL's Technical Information Department (TID), thrives on helping make the exciting research carried out by the Laboratory come alive for employees, other scientists, and the public. She leads the NIF & Photon Science Directorate Document Services team, a multidisciplinary group of designers, illustrators, writer/editors, animators, photographers, videographers, and web developers. The team supports the Directorate's strategic communications efforts by producing visually appealing and readable materials, including annual reports, newsletters, posters, brochures, displays, conference packages, and presentations for use at conferences, visitor lobbies, recruiting booths, and other venues.

Pam came to the Laboratory in 1989 and has supported clients across the Laboratory. She worked first in TID with a broad base of clients, then moved to the Engineering Directorate as the lead of the Engineering Art and Edit Team. She transferred to NIF&PS in 2001.

She received her BFA in Design from Howard University and worked at Labat-Anderson (a consulting firm), the FBI, and the Educational Testing Service before moving to California to join LLNL.

What Pam enjoys most about the Laboratory and NIF&PS is the broad range of projects and the access to new technology. "I have been able to utilize the latest technology to deliver creative solutions to my clients," she says. "Working at the Lab has always been both challenging and fulfilling."

Favorites and noteworthy

- Member of Delta Sigma Theta Sorority, Inc., a non-profit organization that promotes academic excellence and provides assistance to those in need through established programs.
- In her time away from the Lab, Pam likes to cook, garden, weld, hunt, and connect with friends and family.



**Suzanna
Townsend**
Software Standards and
Quality Manager

Suzy Townsend is a computer scientist and has been supporting NIF since June 2000. Suzy joined LLNL after graduating from California State University Stanislaus with a BS in computer science, a B.A. in mathematics and a minor in chemistry.

As a Computation employee, Suzy has supported several areas including Hazardous Waste Management, Joint Conflict and Tactical Simulation and NIF's Integrated Computer Control System (ICCS). While at NIF she has worked as an individual contributor, database team lead and controls test team lead as well as her current assignment.

Her career has included multiple administrative Group Lead positions and a recent tenure as the Deputy Division Lead for the NIFC division.

Favorites and noteworthy

- Favorite subjects in high school: Chemistry, physiology, and math
- Favorite subjects in college: Zoology, organic chemistry, math
- Noteworthy accomplishments: R&D 500 Award (contributions to the Automatic Alignment System for NIF's ICCS), Laboratory Science & Technology Award (contributions to Experiment Automation System for NIF).



**Diana
VanBlarcom**
Chemical Engineering

Diana is a chemical engineer supporting the Optics Processing Facility at the NIF. She earned her bachelor's degree in Chemical Engineering from the Ohio State University in 2006. While an undergraduate at Ohio State, Diana worked as a co-op engineer at DuPont in Parkersburg, WV. She supported production of Teflon® copolymers: FEP and PFA.

Diana earned her PhD in Chemical Engineering from the University of Texas at Austin in 2010. Her research involved incorporating pH-responsive hydrogels with silicon substrates toward microsensing applications. While a graduate student, Diana was a visiting scientist at Tokyo Women's Medical University in Tokyo, Japan, and the University of New South Wales in Sydney, Australia.

Diana joined LLNL in 2010. She is a process engineer for the cleaning and anti-reflective coating of optics as part of the NIF "recycle" loop. Diana also supports research activities towards higher damage resistance of NIF final optics.

Favorites and noteworthy

- Favorite subjects in high school: Chemistry and math
- Favorite subject in college: Physical Chemistry
- Noteworthy accomplishments: High School Valedictorian; National Science Foundation Graduate Research Fellowship recipient.



Lana Wong
Materials Scientist

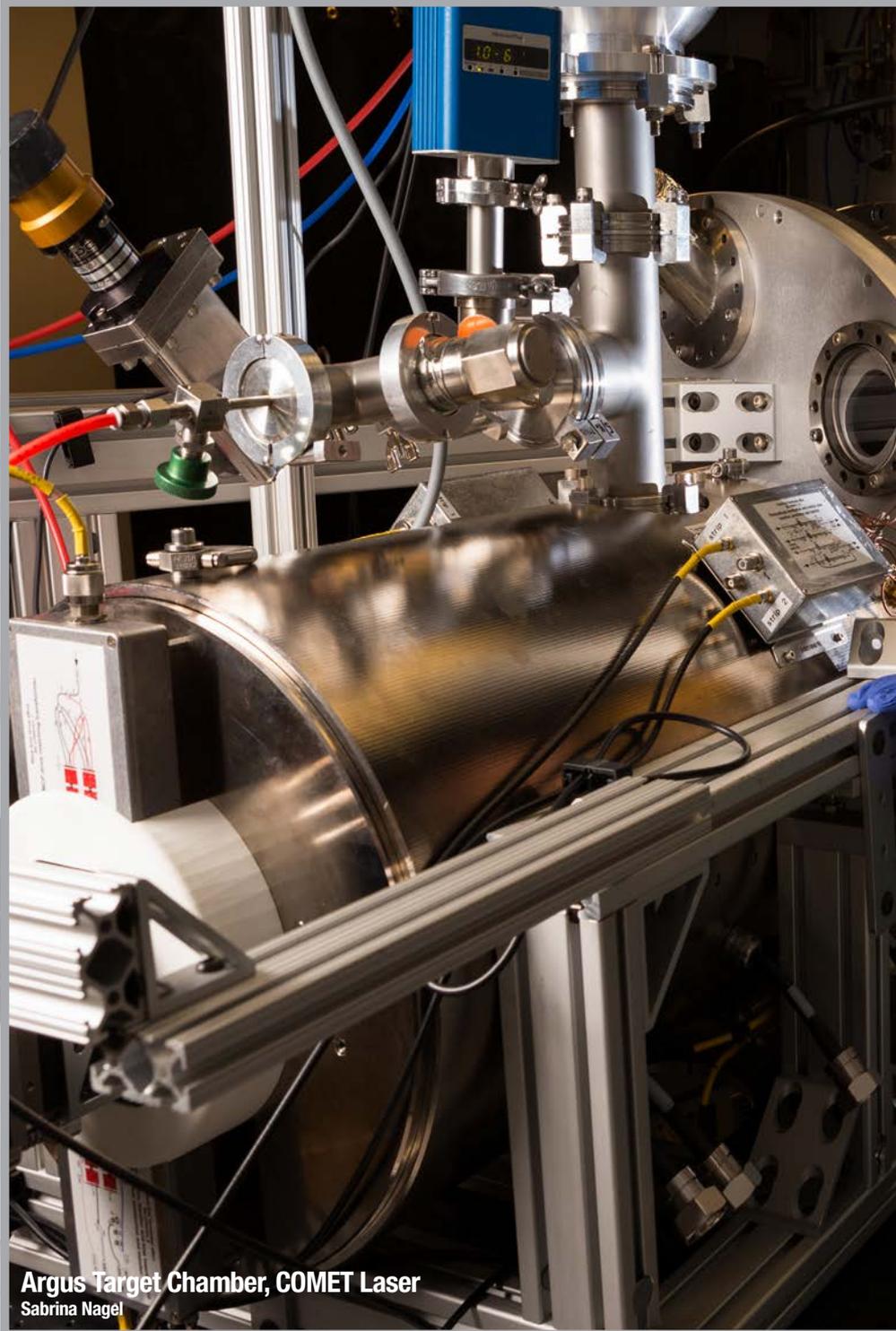
Lana is a materials scientist supporting the optics efforts for the National Ignition Facility (NIF) at the Lawrence Livermore National Laboratory (LLNL). She divides her time between production and research responsibilities as the component engineer for the disposable debris shield (DDS) and support for Science & Technology efforts related to NIF optics. She earned her BS degree in Ceramic Engineering and MS degree in Materials Science & Engineering both from the University of Washington.

Lana enjoyed math and sciences in high school which naturally led her to study engineering in college. A space shuttle tile demonstration, highlighting fast heat dissipation, at a science fair lured her into the field of ceramic engineering.

Lana worked in the refractories industry right after college. Over 14 years, she developed new formulations and technologies for refractory castables, plastics and mortars. In 2002, Lana arrived at LLNL to support the Yucca Mountain Project (YMP). She developed much needed cleaning protocols for the Long Term Corrosion Test Facility (LICTF) coupons exposed to various groundwaters. Since 2004, Lana has provided technical support for NIF in the areas of finishing (sub-surface damage) including slurry stabilization to prevent agglomeration during polishing, as well as etching and mitigation strategies to reduce or eliminate laser-induced damage on NIF optics by improving their surface quality.

Favorites and noteworthy

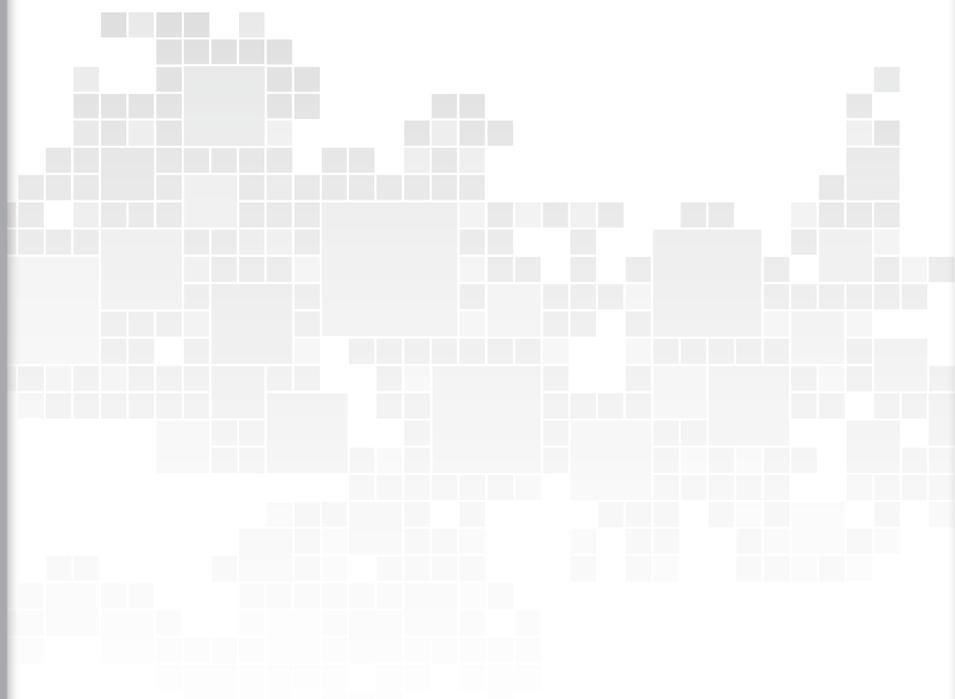
- Favorite subjects in high school: Biology, Calculus
- Favorite subject in college: Mechanical Properties of Materials
- Noteworthy accomplishments: Helped improve the damage threshold of fused silica optics for NIF, produced a set of corrosion data used to model the lifetime prediction of the Yucca Mountain containers, and helped develop self-flowing castable technology in the refractories industry.



Argus Target Chamber, COMET Laser
Sabrina Nagel



NIF&PS



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