Presenter Bios

"Pulling out DNA from your own cheek cells!" - Harshini (Harshi) Mukundan, - Topic: Biology, Room 1.

The presenter will give a short presentation on DNA and how it guides genetic information. This will include some history of genetics and DNA of microbes and how we learn to fight infectious diseases through them. This will be followed by a simple hands-on method for separating DNA from your own cheek cells, something that everyone can try and do at home.

Harshini Mukundan has a masters degree in microbiology and a Ph. D in biomedical sciences. She was a NIH post-doctoral fellow at LANL for 3 years before converting to staff scientist in 2009. Since then, Harshi has been primarily involved in the development of novel diagnostic approaches for the detection of infectious disease causing microorganisms. Her primary interests are in influenza, tuberculosis and shigella diagnosis. In her spare time, Harshi enjoys reading, dancing and spending time with her children.

"Cryptography and Steganography – From Cesar to Shannon" - Sarah L Morgan - Topic: applied math, Room 4.

In this Cryptography and Steganography workshop participants decrypt messages using systems from Ancient to modern times. These systems include the Julius Caesar cipher, 20th century steganography and computer encryption methods.

Sarah's first computer science course was a great revelation to her because it was then that she discovered her career. After graduating from the University of Central Florida in 1983 she worked in aerospace where she was introduced to cryptography. Sarah took a job at Los Alamos National Lab as a computer scientist so she could live in enchanting Northern New Mexico. Sarah's obsession with patterns extends to her hobby, quilting. Sarah, her husband and their various critters live here in Los Alamos.

"Aviation/Aerospace" – Virginie Dupont and Marianne Francois - topic: Physics, math, Room 8.

When you look out the window of an airplane, the wing doesn't appear to be "doing" anything, yet you know that's what is keeping you up. Flying aircraft is fun and empowering, but it requires a wide range of technical skills, from basic calculations involving speed and fuel burn, to interpreting weather maps, to understanding engines and electrical systems. Find out how airplanes fly, and how you - as an engineer - can get them off the ground and keep them in the air!

Virginie Dupont is a postdoc in the physics and chemistry of materials group at Los Alamos National Laboratory. Her studies in Mechanical and Aerospace Engineering led her to pursue research in computational materials science, a multidisciplinary area involving materials science and computer science. Computational materials science helps to solve and analyze engineering and scientific problems that involve materials, such as their strength under different loads, and how to make them stronger. In her leisure time, Virginie enjoys flying. She is a private pilot and

a member of the Ninety-Nines Rio Grande Norte Chapter, which is an international organization of women pilots.

Marianne Francois is a scientist in the computational physics and methods group at Los Alamos National Laboratory. Her studies in Aerospace Engineering led her to do research in computational fluid dynamics (CFD), a multidisciplinary area involving applied mathematics, fluid mechanics and computer science. CFD helps to solve and analyze engineering and scientific problems that involve fluid flows, such as the air flow around aircraft, for example. In her leisure time, Marianne enjoys flying. She is a private pilot, a member of the Civil Air Patrol Los Alamos Composite Squadron and the Ninety-Nines Rio Grande Norte Chapter, which is an organization of women pilots.

"Ooey Gooey Polymers," - Debra Wrobleski and Cindy Welch - topic: chemistry, kitchen in basement, Room 11.

Hands-on learning of properties of polymers through exploring cross-linking reactions and examining water absorbing polymers. We will cross-link polyvinyl alcohol with borax solution thereby changing the physical properties of the polymer. The water absorbing properties of super absorbent polymers will be examined.

Debra Wrobleski received BS (1978) degree in Chemistry from the Indiana University and a Ph.D. (1983) in Chemistry from the University of Illinois, Champaign-Urbana. After graduation, she worked as a Director's Funded Post Doctoral fellow at LANL, followed by working in the Polymers & Coatings Group.
She is a chemist working in polymer science at Los Alamos National Laboratory, where her research projects include studying gamma irradiation effects and thermal aging effects on polymers used in as binders in high explosives. She decided to pursue a science career during college chemistry and math classes. Her current hobbies include hiking, gardening, and outdoor activities. Her daughter and son will graduate in May with chemistry and engineering/physics BS degrees, respectively. Both are planning to go on to graduate school.

Co-Presenters Bio: Cindy Welch received BS (1992) and MS (1999) degrees in Polymer Science from the University of Southern Mississippi and a Ph.D.
(2001) in Polymer Science & Engineering from the University of Massachusetts, Amherst. After graduation, she worked as a research engineer at Dow Chemical Company in Midland, MI (2001-2003) before coming to LANL, where she now works in the Polymers & Coatings Group. She is a polymer scientist at Los Alamos National Lab, where her research projects include studying polymers used in fuel cells and mechanical properties of polymer membranes. She decided to pursue a science career during her high school chemistry class because she enjoyed learning about molecules and what functions they serve. Her current hobbies include hiking, camping, and any activity with her 3 daughters (ages 11, 2, and 3 months).

"Robotics: Designing patterns with mobile robots," - Jan Frigo, Susan Coulter, and Lisa Day - topic: Engineering, Computer Science, Room 12.

We will illustrate the concept of sequential programming by using the Mindstorm Robot system. The girls will write their own programs to control a two motor mobile robot. They will send their

programs via an IR link to the Robot that has three pens mounted to its base. The programs will execute - commanding the Robot to complete a task, creating a unique pattern.

Jan Frigo is an engineer in the International Space and Response Division - Space Data Systems Group (ISR-3), at Los Alamos National Laboratory. She received a Bachelor of Science in Electrical Engineering at Marquette University in Milwaukee, WI, and a Master of Science in Electrical Engineering with an emphasis in controls and communications theory from Arizona State University, Tempe, AZ. For the past ten years she has been working in the area of distributed sensor networks, reconfigurable computing systems on a C-to-hardware compiler, and on signal and image processing in hardware. Previously, she worked in the area of spacecraft control system design and analysis, and spacecraft electrical system design, test, and integration.

"Minerals in Makeup" - Karen Jacobs and Mindy Zimmer - Topic: Geology, Room 10.

What makes eyeshadow shimmer? What makes powder smooth? The answers to these questions can be found in rocks. We will explore the connections between rocks and minerals and ancient and modern makeup.

Karen graduated in 2004 with a BS in Geology and got my Master's in Earth Science in 2007. She came to Los Alamos National Lab in 2009 to work in chemistry, but her real interests are still geology and Earth science.

Mindy Zimmer is a postdoc at Los Alamos National Laboratory. She has a PhD in Earth Sciences, but currently works in Nuclear Forensics. She also enjoys cooking, hiking, biking, and spending time with her family.

"Hydrogen Fuel Cells: See what a single cell is!" - Calita Quesada, Topic: Engineering/Chemistry, Room 3.

Introduction to the lightest, most abundant element in the universe using sweets and toothpicks for chemical bonds. See what a single cell fuel cell is with hands on pieces and assembly. The students will play a game that turn the them into molecules of Hydrogen and Oxygen to form H2O. They will drive a hydrogen powered mobility cart and see a small hydrogen balloon ignite!! It shows that it is light, highly reactive, and different from He.

I am a Chemical Engineer and graduated from New Mexico Institute of mining and Technology (NMT) in 2007. I joined the Peace Corps a few months after I graduated and returned in 2010 to work at LANL (a post-bachelors). Currently I am working on my Masters in Materials Engineering from NMT through distance education.

"Emergency Medicine: When seconds count! Helicopter Flight Nursing" Erin Johnson and Ashley Young - Topic: Medical Science, Room 5.

Will talk to the girls about what we do and demonstrate some equipment, allowing girls to listen to the lungs, take a pulse, place pt's on monitor and other equipment.

Helicopter flight nurse for Tri-state Careflight. 17 years of nursing experience in emergency medicine for hospital Emergency Room (ER) and flight.

"Nutrition: Science vs. the latest Trend" - Sara Pocernik - Topic: Medical Science / Biology, Room 6

We will discuss the basic biochemistry of carbohydrates, proteins, & fats, as well as touch upon their roles in health and disease. We will also 'put to rest' a few common nutrition myths & emphasize the importance of research in determining nutrition recommendations. Educational requirements for Registered Dietitians as well as a brief discussion of career opportunities in nutrition.

B.S. Nutritional Science & Dietetics, Michigan State University 1998
Dietetic Internship Brigham & Women's Hospital, Boston 1998-99
M.S. Nutritional Biochemistry, Tufts University 2004
Certified Nutrition Support Dietitian, American Society for Parenteral & Enteral Nutrition, 2007

Clinical Dietitian at Beth Israel Deaconess Medical Center & Tufts-New England Medical Center, Boston Teaching Assistant, Simmons College, Boston (in partnership with BIDMC) Professor of Biochemistry in Department of Family Ecology & Nutrition at the University of Puerto Rico, Rio Piedras Campus Currently working as a Clinical Dietitian per diem for Apria Healthcare, Santa Fe

"Ocean Density, Currents, and Ice" - Elizabeth Hunke and Nicole Jeffery – Topic: Earth Sciences, Room 7.

Do you know what causes the ocean currents to flow from one place to another? Come experiment with ice, water and salt to find out! We will explore freezing, melting and density changes in miniature oceans, and learn how these processes relate to Earth's climate.

Elizabeth Hunke's educational background includes a Ph.D. in Applied Mathematics, a discipline she chose for the flexibility it provides. She studied hurricanes initially, but her specialty has since become sea ice and polar climate. Elizabeth spent 6 weeks on board a research vessel in the Antarctic, drilling ice cores and obtaining other sea ice measurements, but her primary job description involves high-performance computer model development and simulation of the polar climate. As a licensed woman pilot, her mathematical background combined with her knowledge of weather and climate also serves her interest in flight.

Nicole Jeffery started college as a biology major, spent a few years studying chemistry and completed a degree in physics. She then discovered oceanography, the perfect mix of biology, chemistry and physics. Since finishing her Ph.D., Nicole has been working in the Climate, Ocean, and Sea Ice Modeling group at Los Alamos.
She studies ocean flow and sea ice physics, and is currently building computer models of the microscopic plants and animals that live inside sea ice.