

Five Los Alamos scientists honored as 2018 Laboratory Fellows

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LOS ALAMOS, N.M., Oct. 16, 2018—Five Los Alamos National Laboratory scientists are being honored as Laboratory Fellows this year: James Boncella, Angel Garcia, Lawrence Hull, David Jablonski and Sergei Tretiak.

“To be named a Fellow is one of the Laboratory’s highest honors,” said Terry C. Wallace, Jr., Los Alamos National Laboratory director. “All Fellows have demonstrated remarkable scientific achievement that has benefited not just the Laboratory and its mission, but the scientific community as a whole. These are leaders in their fields and it is an honor to name them Fellows.”

James Boncella of the Chemistry division made the seminal discovery of the first set of nitrogen analogs of the ubiquitous uranyl ion. For decades, many other researchers sought to synthesize these complexes but were unsuccessful. Indeed, calculations even showed that they were unstable and not isolable. His elegant and simple synthetic technique paved the way for a resurgence in the actinide field to better investigate the concept of covalency in actinide-ligand bonding. His body of work with uranium imido complexes has established him as one of the world’s foremost authorities on fundamental actinide chemistry. He is a Fellow of the American Chemical Society and has published 129 manuscripts. In his 15 years at Los Alamos, Jim has mentored over 20 postdoctoral researchers and three graduate students.

Angel Garcia of the Center for Nonlinear Studies has earned international recognition as a world renowned theoretical and computational biophysicist. His research has illuminated the physics of life and the supporting letters call him a giant in theoretical and computational biophysics and a pioneer in the study of macromolecular conformation, dynamics and folding. His ideas and approaches drive the field and influence almost everyone performing bio-molecular simulations. He invented principal component analysis of large-scale and amplitude motions in proteins. In his work on biomolecular computations, he addressed basic chemical physics such as cavities in proteins, solvation, hydration, electrostatics and the nature of molecular interactions. Garcia has made fundamental contributions to art of molecular dynamic simulation that have been widely adopted and used by the molecular dynamics community. He has 171 peer-reviewed publications. Garcia has provided sustained intellectual and scientific leadership in support of mission science through his leadership of the Center for Non-Linear Studies (CNLS).

Lawrence Hull of the Integrated Weapons Experiments division has made sustained, high-level intellectual contributions to both the weapons program and broader scientific

community in over 30 years working at Los Alamos. He is the leading authority in understanding the complex mechanisms and physics underlying high-explosive–metal interactions. He has received over 21 awards, including four LANL Distinguished Performance Awards, eight National Nuclear Security Administration Defense Programs Awards of Excellence, and one unique Commendation from the UK Ministry of Defence. Particularly notable is Hull’s vast creativity and ingenuity in designing and executing difficult experiments dealing with high explosives and shock physics. Hull has made deep, enduring and direct impacts on the safety, security and effectiveness of our nuclear stockpile.

Dave Jablonski of the Laboratory’s X Theoretical Design Division has made contributions to stockpile stewardship and national security of striking breadth. He exhibits a rare combination of creativity, physical intuition, persistence, skepticism, and attention to detail. These qualities have allowed him to make seminal advances in the science and design of nuclear weapons. Jablonski has pioneered new approaches to old problems that enabled transformations in understanding. The most significant of these have been in the areas of energy balance, boost physics, and design procedures. In each case, the pioneering work led to fundamental changes in how the problem was framed, changes in methods, and later breakthroughs by the broader community. Jablonski has distinguished himself with a strong publication history and an exceptional record mentoring junior staff.

Sergei Tretiak of the Theoretical Division is an exceptionally creative chemical physicist. The overarching theme of his research is to develop a theoretical framework for electronic properties in complex molecular structures. These materials are at the center of current scientific research, with potential applications in photonics, displays and sunlight harvesting, such as photovoltaic devices based on organic and organic–inorganic active materials. His numerous significant contributions to the understanding of optical processes in advanced, reduced-dimensional materials are being developed for optoelectronics applications. His theoretical studies have provided extremely important descriptions of photo-physical-chemical phenomena in novel molecular systems. The suite of powerful theoretical techniques and elaborate codes that Tretiak developed has substantially influenced the way computational materials chemistry is currently studied worldwide. He is one of the world leaders in understanding non-linear excitations, such as in optical materials. Tretiak has mentored and trained more than 20 postdoctoral associates and 80 summer students, and he won the LANL Postdoctoral Distinguished Mentor Award in 2015. He is a world-leading electronic structure theorist who has transformed optical material science to enable next-generation energy systems.

The Fellow appointment at Los Alamos is an honor bestowed in recognition of outstanding achievement in science and/or engineering, recognizing the full breadth of Laboratory accomplishment from basic research to applied missions. Nominations are assessed on the basis of three criteria:

- Sustained, high-level achievements in programs of importance to the Laboratory
- A fundamental or important discovery that has led to widespread use
- Having become a recognized authority in the field.