

RALUCA O. SCARLAT



BIOGRAPHY

Professor Raluca O. Scarlat is an Associate Professor in the Nuclear Engineering Department at University of California (UC) Berkeley. Prof. Scarlat’s research encompasses chemistry and materials for nuclear fusion and fission energy, as well as batteries, and critical minerals. Prof. Scarlat has expertise in electrochemistry and physical chemistry, corrosion, tritium management, advanced nuclear reactors, reactor safety and thermal-hydraulics, and engineering ethics.

Prof. Scarlat’s expertise in the areas of (1) Nuclear Reactor Safety and Thermal-Hydraulics, (2) Materials and corrosion, and (3) Plant Operation is of relevance to (1) understanding inspection and maintenance, sensor calibration, interfacing with Nuclear Regulatory Commission (NRC) inspections, necessary operator and staff training, human factors considerations, regulations and procedures, severe accident management guidelines, understanding application of safety principles, functioning principles of passive and active safety systems, probabilistic risk assessment for the units; (2) corrosion control, materials degradation, environmental monitoring and transport of radioisotopes in the environment; (3) adequate staffing and training, outage planning, sensors and controls, refueling operations, emergency preparedness, worker safety, and the role of the safety culture.

Prof. Scarlat has co-authored 49 journal publications, 41 refereed conference proceedings, and a book chapter. She currently serves on the Nuclear Safety Committee and the Advisory Committee for UC Davis’ McClellan Nuclear Research Reactors in Sacramento, CA. Prof. Scarlat served two terms on the Nuclear Energy Advisory Committee (NEAC) for the US Department of Energy, Office of Nuclear Energy. Prof. Scarlat has been awarded the American Nuclear Society (ANS) Mary Jane Oestmann Achievement Award in 2021. She has served as a working group member for the Development of ANS 20.2 Standard, “Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten Salt Reactor Nuclear Power Plants,” and on the American Society of Mechanical Engineers (ASME) standards task group on graphite issues for Molten Salt Reactors (MSRs).

Prof. Scarlet has established the SALT research group at UC Berkeley, with capabilities in high temperature experimental studies for molten salts and high temperature materials, with the unique capability of handling both beryllium, which is respiratory and dermal hazard, and radioactive materials; each semester 15 to 25 graduate students, postdoctoral scholars, and undergraduate students train and perform research in the SALT Lab. Prior students and postdoctoral scholars are now faculty, research scientists at national laboratories, and engineers in advanced reactor companies.

Prof. Scarlet completed her Ph. D. in Nuclear Engineering with Designated Emphasis in Energy Science and Technology at UC Berkeley in 2012; a Certificate in Management of Technology, Haas School of Business at UC Berkeley in 2009; and her B.S. in Chemical and Biomolecular Engineering, Cum Laude from Cornell University in 2006. Prof. Scarlet worked as a chemical engineer for ExxonMobil, developing and deploying abnormal event detection applications for petrochemical plants, and training engineers and operators in the development and use of advanced controls applications; she received a Leadership Award from the ExxonMobil Automation & Optimization Division in Dec. 2006. In fall of 2011, after the Fukushima Dai-Ichi Nuclear Power Plant accident, Scarlet joined Hitachi GE, in Ibaraki Prefecture, Japan, for an engineering internship, to study severe accident progression at Fukushima Dai-Ichi Units 1 and 2, for the purpose of making recommendations for towards improving severe accident management at the boiling water reactors (BWRs) in Japan. She was an assistant professor at University of Wisconsin Madison, in the field of thermal-hydraulics and reactor safety from 2014 to 2018. She joined as faculty of UC Berkeley Nuclear Engineering in 2019, where she performs research on chemistry and corrosion in molten-salt media; she also holds a Chemist Faculty Scientist/Engineer position at Lawrence Berkeley National Laboratory. Prof. Scarlet has taught graduate and undergraduate courses on Molten Salt Reactors and Tritium Breeding Blankets; Nuclear Fuel Cycle; Ethics, Engineering and Society; Molten Salt Chemistry and Corrosion; Engineering Thermodynamics; Nuclear Engineering Design; Economic and Environmental Aspects of Nuclear Engineering; Molten Salt Technology; and Safety Analysis and Process Safety, and she currently serves as the Vice Chair of Undergraduate Matters for the Nuclear Engineering Department at UC Berkeley.