Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Data-driven predictive science for low-temperature plasmas ZHE-HUI WANG, Los Alamos National Laboratory (LANL), WALTER GEKELMAN, University of California, Los Angeles (UCLA), AYAN BISWAS, CHRISTOPHER BIWER, LANL, WENG W. CHOW, Sandia National Laboratories, JAMES COLGAN, GIAN LUCA DELZANNO, LANL, JOHN FOSTER, YOGESH GIANCHANDANI, University of Michigan, HAN HTOON, EARL LAWRENCE, LANL, ALEX PETERSON, Lam Research, GHANSHYAM PILANIA, LANL, PATRICK PRIBYL, UCLA, EARL SCIME, West Virginia University, STEPHEN VINCENA, UCLA — LANL, Sandia, UCLA, University of Michigan, West Virginia University, Lam Research Corporation, and collaborators propose to form a new center for predictive science of low-temperature plasmas. The centers mission is to demonstrate capabilities to predict and control plasma kinetics in eV low-temperature regime such as in semiconducting processing plasmas. The center is founded on the emerging fourth paradigm for scientific discovery and technology development, which uses rapidly advancing big data technologies and methods. The generation, processing, and applications of large experimental and simulation data sets coherently link interdisciplinary center expertise in experiments, plasma theory & simulations, and statistical methods & machine learning, culminating in predictions and controls. The new and potentially revolutionary diagnostics and sensors include Micro Electro and Mechanical Sensor probes, microparticle cloud imaging, nanoprobes enabled by nanocrystal and quantum dots. Existing experiments will be leveraged.

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Date submitted: 28 Jun 2019

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