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Shining a Light on the Complex Physics of Low- Temperature Plasmas

Research into low-temperature plasmas (LTPs) is a thriving area, stimulated not only by the range of applications of LTP devices, but also by the richness and complexity of the physical phenomena which have in recent years become evident in such plasmas - instabilities and self-organization, for example. Understanding such phenomena offers a means of optimizing the performance of existing devices, while also guiding the development of next-generation sources. Such objectives are challenging and will require a combination of advanced numerical, theoretical, and experimental approaches, many of which are still under development.

New experimental approaches applied to LTPs can offer insights into aspects such as particle properties and dynamics, which may be inaccessible to conventional diagnostics. In recent years, highly-sensitive coherent and incoherent Thomson scattering implementations have been achieved for magnetized LTPs, providing evidence for, and information on, instabilities implicated in anomalous transport, and new access to electron properties. In this talk, recent insights gained from Thomson scattering in such plasmas will be discussed, with illustrations of how dialogue between experiments, theory and numerical simulations have improved current understanding.

About the Speaker: Dr. Sedina Tsikata is a researcher with the CNRS, the French National Center for Scientific Research, working at the ICARE laboratory in Orléans, France. She received undergraduate and graduate degrees from, respectively, MIT and Ecole Polytechnique, and her postdoctoral research was funded by the French Space Agency. Her main research focuses on understanding phenomena in magnetized plasmas via the development and application of new diagnostics. Dr. Tsikata has received recognitions from the French Physics Society (*Prix René Pellat*) and from the CNRS (*Médaille de Bronze*).