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### **Building Scientific Reproducibility into Plasma Research<sup>1</sup>**

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The reproducibility crisis of modern science is the inability of scientists to reproduce roughly half of the results published in scientific journals. This crisis has affected a broad range of fields, such as psychology, chemistry, and oncology. While physicists tend to have high confidence that physics research is reproducible, no comprehensive studies have been performed to support or refute this claim. Nevertheless, the scientific, cultural, and institutional practices that contribute to the reproducibility crisis in other fields are also present in plasma science. This tutorial will describe how to implement best practices for scientific reproducibility into plasma research. The talk will begin by outlining sources of irreproducibility, such as cognitive biases, improper use of statistics, publication bias, closed access policies for data and software, and the reward system for modern academia. The talk will then describe remedies for these problems such as open access data policies; open metadata standards; open source software; training on proper use of statistics; pre-registration of research methodologies; independent methodological and statistical support; and valuing the reproducibility of research in tenure, hiring, and funding decisions.

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