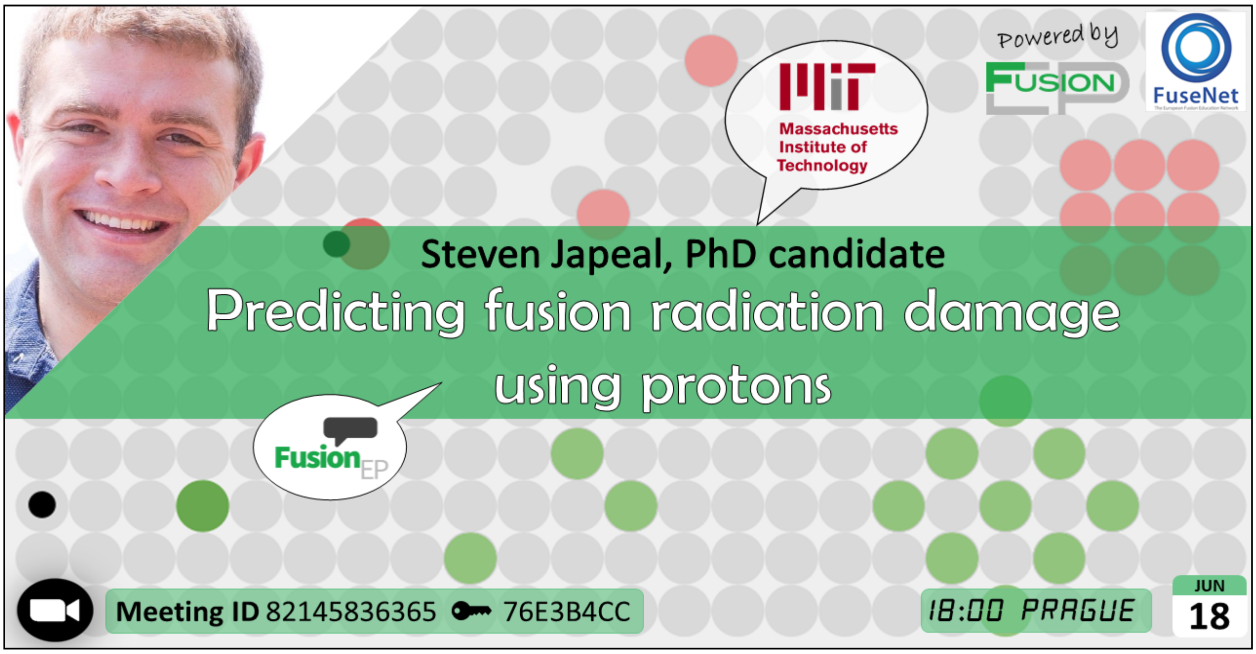


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**Title**: Predicting fusion radiation damage using protons

**Speaker**: Steven Japeal, PhD candidate at MIT

**When**: 2020-06-18 18:00:00

**Abstract**: The interior of a fusion power plant will be an extreme radiation environment, outside the realm of humanities experience with radiation sources like fission reactors. The materials that make up these power plants must withstand heavy exposure to high energy neutrons, which damage materials, degrading their properties, and driving the components towards failure. Without the ability to accurately reproduce the expected neutron environment through experimentation or simulation, the first fusion power plants face enormous risk of radiation-induced failure of their key components. In order to improve our ability to predict material performance under fusion neutron irradiation, we need new experimental methods for high-fidelity radiation damage testing. Intermediate energy (10-30 MeV) proton irradiation is an under-utilized irradiation technique that could produce radiation damage with high fidelity to a fusion environment Recently, advances in particle accelerator technology have allowed sources of intermediate energy (10+ MeV) protons to become commercially available at a cost and size appropriate for university labs. This talk will give a high-level overview of our work to demonstrate through simulations, theoretical analysis, and experimentation, that protons could play a pivotal role in predicting fusion material performance, ultimately improving the probability of the success of fusion as a global power source.

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