Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **2585** Type: **Invited Speaker / Conférencier(ère) invité(e)**

Methods to constrain thermonuclear rates (by and for John D'Auria)

Tuesday 4 June 2019 14:15 (30 minutes)

An accreting compact star in a binary system can generate periodic thermonuclear runaways on its surface. In the case of a white dwarf star, the result is a classical nova, which enriches the interstellar medium with newly synthesized nuclides. In the case of a neutron star, a detectable burst of X-rays is emitted. Nucleosynthesis and energy generation in these events depends on thermonuclear reaction rates, which are especially challenging to measure directly in the laboratory when the reactants are radioactive. John D'Auria led a collaboration to surmount this challenge; in the process, he included and inspired a new generation of scientists. Some of John's earlier work showed that beta decay is also an effective method to determine thermonuclear rates indirectly. A new program of beta decay experiments to constrain thermonuclear rates is being pursed at the National Superconducting Cyclotron Laboratory by a collaboration including one of John's mentees. In particular, the Gas Amplifier Detector with Germanium Tagging (GADGET) system, developed to measure very weak low-energy beta delayed proton emission branches and gamma rays, is now operational.

Author: Prof. WREDE, Christopher (Michigan State University)

Presenter: Prof. WREDE, Christopher (Michigan State University)

Session Classification: T3-3 Nuclear Astrophysics/Structure and Medical Isotopes in honour of Prof. John D'Auria PM-1 (DNP) | Astrophysique nucléaire / Structure et isotopes médicaux en hommage au prof. John D'Auria PM-1 (DPN)

Track Classification: Symposia Day - Nuclear Astrophysics and Medical Isotopes (in honour of Prof. John D'Auria)