

FINAL SCIENTIFIC/TECHNICAL REPORT

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Student Research Awards – Sherwood Fusion Theory Conference

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Section 1. Abstract

Student research awards were given for outstanding student presentations at the Annual International Sherwood Fusion Theory Conference, held May 1-3rd 2017 in Annapolis, MD. The goal of controlled thermonuclear fusion research is to develop a safe, environmentally benign, and essentially inexhaustible source of energy for the future. The Annual International Sherwood Fusion Theory Conference is organized for educational and scientific purposes in support of fusion energy and plasma physics research. Specifically, the objective of the Annual Conference shall be the communication of recent results in the physics of controlled fusion energy. This conference is conducted in accordance with the International Council of Scientific Unions guidelines on free circulation of scientists. Papers are solicited on the following topics for the International Sherwood Fusion Theory Conference: Plasma Properties, Equilibrium, Stability, and Transport; Physics of Plasma Edge and Divertor Region; Plasma Production and Heating; Computer Simulation of Plasmas. Student research awards at Sherwood serve several purposes. First, student research awards generally help recruit and retain top students in fusion energy sciences, because they highlight excellence in research and help to develop the CVs of young scientists. Second, the Sherwood Fusion Theory Conference has a long history of student research awards, and continuing this tradition helps to maintain the integrity and impact of past awards. Third, research awards in theory are especially important because they highlight not only individual students, but the entire theory field in fusion energy sciences.

Section 2. Sherwood Conference Background

The Annual International Sherwood Fusion Theory Conference is organized for educational and scientific purposes in support of fusion energy and plasma physics research. Specifically, the objective of the Annual Conference shall be the communication of recent results in the physics of controlled fusion energy. This conference is conducted in accordance with the International Council of Scientific Unions guidelines on free circulation of scientists. Papers are solicited on the following topics for the International Sherwood Fusion Theory Conference: Plasma Properties, Equilibrium, Stability, and Transport; Physics of Plasma Edge and Divertor Region; Plasma Production and Heating; Computer Simulation of Plasmas.

The conference is known as "The Annual Controlled Fusion Theory Conference" and is also commonly referred to as the "International Sherwood Fusion Theory Conference." And will be referred to throughout this document simply as "Sherwood 2017".

The Annual Conference is organized for educational and scientific purposes consistent with the meaning of section 501 (c) (3) of the Internal Revenue Code. Specifically, the objective of the Annual Conference shall be the communication of recent results in the physics of controlled fusion energy. The Annual Conference originated in 1974 and has continued successfully to the present. The most recent Conference was held in Annapolis, MD, May 1-3rd 2016, and was organized by MIT.

Section 3. Details of the 2017 Sherwood Conference

DOE funds provided for six (6) student research awards in the amount of \$500 each, for a total request of \$3000 at Sherwood 2017. No other funds for the conference were requested. The Annual International Sherwood Fusion Theory Conference, will be held May 1-3rd 2017 in Annapolis, MD. Details can be found at the conference website: <http://www.sherwoodtheory.org/sw2017/index.php>

The six winners of the student poster awards in 2017 were

1. Mr. James Juno, poster on "Continuum Vlasov Simulations of Magnetized Shocks"
2. Mr. Benjamin Faber, poster on "Examining the zero-magnetic-shear approximation for low-shear stellarators"
3. Mr. Caoxiang Zhu, poster on "Flexible optimized coil designing method using space curves"
4. Mr. Tyler Cote, poster on "Ballooning stability of tokamak pedestals in the presence of strong applied 3D magnetic perturbations"
5. Ms. Elizabeth Paul, poster on "Rotation and Neoclassical Ripple Transport in ITER"
6. Mr. Adrian Fraser, poster on "Coupling of Damped and Growing Modes in Shear Flow Turbulence"