The Creation of a PPPL-NASA Collaboration for Science Education

ANDREW ZWICKER, JOHN DELOOPER, JAMES T. MORGAN, JERRY L. ROSS, STEPHANIE A. WISSEL, PPPL — For the past three years, PPPL’s Science Education Program has collaborated with NASA’s Microgravity University and The College of New Jersey’s Departments of Physics, and Mechanical Engineering. The collaboration provides a unique academic experience for undergraduate students to successfully propose, design, fabricate, fly and evaluate a reduced gravity experiment of their choice over the course of four-six months. Our collaboration has focused on dusty plasmas that measured the sheath electric field using dust particles as probes, dust acoustic waves, and particle dynamics in microgravity. Recently, the collaboration was expanded to include the NASA Explorer School program and K-12 teachers in our DOE-sponsored Academies Creating Teacher-Scientists (DOE-ACTS). Here, experiments focused on measuring convective flow in a varying gravitational field using a plasma ball and “glitter lamp.” Data from the experiment was used to create new curricula for 6-12th grade physical science classes. It is expected that both programs will expand in future years.