Georgia Tech Center for Space Technology and Research

Summer Faculty Positions at the Jet Propulsion Laboratory

Current research at the Georgia Institute of Technology is advancing the frontiers of space science, Earth science, astronomy, astrophysics, space technology, robotics and space systems engineering, while demonstrating a strong commitment to undergraduate and graduate education in these areas.

The Center for Space Technology and Research (CSTAR) is an interdisciplinary research center that serves to organize, integrate and facilitate the impact of Georgia Tech's space science and space technology research activities. CSTAR brings together a wide range of Georgia Tech faculty, active in space science and space technology research, and functions as the Georgia Tech focal point for growth of the space industry in the state of Georgia. In 2012, Georgia Tech and the Caltech Jet Propulsion Laboratory (JPL) formally entered into a strategic partnership designed to promote and encourage collaboration between the institutions, with a focus on research collaborations and personnel exchanges in science and engineering fields of mutual interest. CSTAR serves as the Georgia Tech focal point for this partnership with JPL.

Through this announcement, CSTAR is soliciting proposals from Georgia Tech faculty who wish to perform collaborative research in summer 2017 at the Jet Propulsion Laboratory. CSTAR anticipates making ~4 awards. Individual proposals may span the entire summer or some portion thereof. Proposals (maximum length of 4 pages) are sought which describe the technical aspects of the proposed collaboration, identify the JPL partners by name, and describe the likely downstream impacts of this summer collaboration. Proposal topics must be aligned with one of the CSTAR research thrusts described in Appendix I. The proposed budget should include faculty salary, fringe, travel expenses and any materials needed. JPL costs, including office space and salary for JPL personnel participating in this effort, will be covered by JPL and should not be included in this proposal. In addition, Georgia Tech overhead should be excluded from the proposed budget.

Proposals for collaboration should focus on the CSTAR research thrusts identified in Appendix I, which may be of interest to JPL, including space-oriented research, space science, space technology, space mission concept development, space flight system and instrument design, or space mission operations.

Five Georgia Tech faculty were selected as CSTAR Summer Fellows@JPL in 2016 and in 2015. The faculty and selected topics may be viewed at http://www.cstar.gatech.edu/cstar-summer-fellowsjpl. A description of the strategic partnership between Georgia Tech and JPL is available at news.gatech.edu/hg/item/150451.

This proposal opportunity is open to all Georgia Tech academic faculty.

Proposal Schedule:
Initial call released to Georgia Tech community: November 7, 2016
Proposals Due: December 16, 2016
Selections announced: January 13, 2017

Proposals should be returned to Thom Orlando at thomas.orlando@chemistry.gatech.edu prior to the due date listed above. Questions related to this announcement may be directed to Thom Orlando (CSTAR Director, thomas.orlando@chemistry.gatech.edu). Additional information on CSTAR is available at cstar.gatech.edu.

Appendix I: CSTAR Objectives and Charter

The Georgia Tech Center for Space Technology and Research serves: (1) to organize, integrate and facilitate the continued growth of Georgia Tech's space science, space technology and space research activities, (2) to foster cross-disciplinary strategic growth opportunities and enhanced student experiences in the space sector, and (3) as a focal point for economic growth of the space industry in the state of Georgia. CSTAR positions Georgia Tech as a thought-leader in the space sector, enhancing the visibility of ongoing educational and research programs while building strategic partnerships and transformational research activities in the following areas:

a) Earth and Planetary Science: The compositions, temperatures and dynamic processes of Earth and other planetary systems in our solar system will be examined using state-of-the-art modeling codes, laboratory simulations and direct measurements. These activities will help us understand solar system formation and the evolution of planetary atmospheres and surfaces over short and long timescales.
b) Radiation Science and Radiation Effects: The radiation environment of solar system bodies will be investigated through satellite observations, dynamic predictive simulations, and state-of-the-art laboratory measurements. The importance of this work lies in understanding the naturally occurring radiation environment, the influence of these high-energy particles on the atmosphere and surfaces of these bodies, and how local electric and magnetic fields can shield or enhance the regional radiation dose. Understanding the effects of high-energy particles, heavy ion and ionizing radiation on carcinogenesis is also critical to any planned deep space human exploration mission (*not likely applicable to this JPL collaboration*).
c) Astrophysics: Investigation of the formation and evolution of galaxies and black holes, and the physics of the extreme environments around black holes and neutron stars. Calculation of the gravitational wave radiation produced by merging black holes and neutron stars. Studies of gamma-ray bursts and pulsars with ground-based neutrino and high-energy gamma-ray telescopes. Innovations in high-performance computing through studies of numerical relativity and simulations of the formation of the first stars and galaxies.
d) Astrobiology and Astrochemistry: Focused efforts in understanding the formation and chemical evolution of molecules (some that have prebiotic relevance) in the interstellar media, Kuiper Belt region, comets and on outer/inner solar system bodies will be pursued using state-of-the art laboratory simulations and quantum-chemical calculations.
e) Space Systems Engineering: State-of-the-art space flight projects will be implemented, including mission concept development, instrument and flight system design, hardware fabrication and testing, and mission operations.
f) Space Technology: Advancing the readiness of critical space technologies, including plasma physics, electric propulsion, advanced materials, chemical propulsion, formation flight, proximity operations, robotics, space situational awareness, communications, sensors, and entry, descent and landing.
g) Space Policy: Providing advocacy and strategic counsel to U.S. civilian and military leaders on future trends in space science and technology that impact our nation's economy, national security and national competitiveness (*not likely applicable to this JPL collaboration*).
h) Space Systems Education and Workforce: Evaluation and assessment of workforce trends, demographics and needs within the space sector to better understand how to educate and train the next generation of space system engineers, scientists and leaders (*not likely applicable to this JPL collaboration*).