

Joseph Ampadu Ofosu**Lecturer**

School of Physics, Engineering & Computer Science
Department of Engineering and Technology

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**Research interests****Thermal Vacuum Testing of Small Satellites**

Joseph Ampadu Ofosu is interested in environmental testing of CubeSats and microsatellites, especially thermal vacuum, thermal cycling, and thermal balance tests. Verifying and validating these tests require a thermal model especially when the tested satellite has no space heritage. Hence, Joseph also studies, develops, and implements thermal mathematical models for small satellites.

To contribute to the Lean satellite concept, which is geared towards making the space field affordable and accessible, Joseph is working on developing and implementing cost-effective thermal vacuum test systems using thermoelectric devices such as the Peltier element.

Advanced Space Propulsion Concepts

Joseph has an interest in laser propulsion concepts where laser-induced plasmas are used as the source of energy for propulsion. This necessitates the study of laser-supported detonation (LSD) phenomenon which is different from the conventional chemical Zeldovich, von Neumann, and Doring (ZND) detonation.

LSD is a plasma discharge physics and requires plasma modeling and diagnostics. Joseph undertakes diagnostic studies using optical emission spectroscopy such as laser-induced breakdown spectroscopy, interferometry, and laser shadowgraphy.

Joseph Ofosu has also worked with microwave-induced plasmas (MIPs) sourced from a 2.45 GHz RF. He was involved in plasma-assisted combustion studies where MIPs are used to enhance the efficiency of both diesel and gasoline engines. He was involved in studies where MIPs are used for detecting radioactive substances and industrial-grade metal powders.

Qualifications

Advanced Energy (Advanced Space Propulsion), Ph.D, Characterization of laser-induced discharge extending in various gas species, University of Tokyo

1 Apr 2014 → 27 Jun 2018

Award Date: 27 Jun 2018

Advanced Energy (Advanced Space Propulsion), Master of Science, Influence of the ambient gas content on the propagation properties of laser supported detonation wave: A case study on Argon and Nitrogen gases, University of Tokyo

1 Apr 2012 → 24 Mar 2014

Award Date: 24 Mar 2014

Employment**University of Hertfordshire**

Lecturer

School of Physics, Engineering & Computer Science

University of Hertfordshire

3 Oct 2023 → present

Lecturer

Department of Engineering and Technology

University of Hertfordshire

3 Oct 2023 → present

University of Hertfordshire

Lecturer

School of Physics, Engineering & Computer Science

University of Hertfordshire

3 Oct 2023 → present

Postdoctoral Fellow

Kyushu Institute of Technology

Japan

14 Apr 2020 → 30 Sept 2023

R&D Engineer

i-Lab., Inc.

Japan

1 Apr 2018 → 31 Mar 2020

Study themes: Advanced Space propulsion concepts (laser propulsion), Environmental testing of satellites

Keywords: Laser propulsion, laser-induced plasmas, optical emission spectroscopy, laser-induced breakdown spectroscopy, atmospheric plasma modelling, thermal vacuum test, thermal balance test, Satellite thermal models

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