## Project Title
Hyperthermal Atomic Oxygen Effects on Satellite Systems

### Lead Supervisor
Dr Peter Roberts

### Co-Supervisor(s)
Dr Steve Edmondson and Dr Vitor Oiko

### Programme
PhD in Aerospace Engineering / Materials

### Research Theme
Aerospace Materials

### Description
GomSpace is a globally leading designer, integrator and manufacturer of high-end nanosatellites for customers in the academic, government and commercial markets. Their space hardening program is a strategic priority allowing GomSpace to enter on the market for longer lifetime LEO missions. One of the key challenges is posed by atomic oxygen interactions with spacecraft surfaces and materials. Atomic oxygen is the major component of the residual atmosphere in Low Earth Orbit, and can produce significant changes in mass and surface properties for many materials through erosion and oxidation. Therefore, a complete understanding of the space environment, interactions and effects in terms of atomic oxygen, along with design techniques and mitigations is needed for GomSpace to achieve its goals.

The University of Manchester is developing a unique experimental facility that replicates hyperthermal atomic oxygen flux in LEO, the Rarefied Orbital Aerodynamics Research Facility (ROAR) as part of the EU funded DISCOVERER project. You will be one of the few PhD students with access to the ROAR facility, being able to participate in its set up and optimization. You will be responsible for studying the effects of atomic oxygen on spacecraft hardware like solar array assemblies. Based on experimental results you will perceive the dominant mechanisms of the gas-surface interaction and devise design changes in other to improve lifetime to expected targets.

In this project you will be responsible for the knowledge transfer between the partners, supporting a close collaboration between the university and GomSpace. The opportunity of working at the interface of two important different sectors will provide you with valuable experience, contributing significantly to your professional formation. You will attend monthly project meetings besides of regular supervisions. There will be opportunities to travel to partner universities in Europe for conferences and project meetings.

### Skills required
Materials characterisation, materials science. Desirable experience with photovoltaic systems and knowledge of the space environment.

### Industrial Links
Part funded by GomSpace and part by the MACE Beacon scholarships. Standard funding for UK/EU.
Confirm breakdown & amount of funding different to standard
Information on standard fees is available here:
http://www.mace.manchester.ac.uk/study/postgraduate-research/degree/
Information on typical stipend is available here:
http://www.mace.manchester.ac.uk/study/postgraduate-research/funding/

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing date for applications*</td>
<td>16 April 2018</td>
</tr>
<tr>
<td>Project specific enquiries*</td>
<td>To Dr Peter Roberts – <a href="mailto:peter.c.e.roberts@manchester.ac.uk">peter.c.e.roberts@manchester.ac.uk</a></td>
</tr>
</tbody>
</table>

**General enquiries:**
General enquiries relating to the postgraduate application process within Mechanical, Aerospace & Civil Engineering should be directed to:

**Martin Lockey** - Senior PG Recruitment & Admissions Administrator
Tel: +44(0)161 275 4345

**Further information about how to apply can be found at:**
http://www.mace.manchester.ac.uk/study/postgraduate-research/apply/