Mansur AHMED

Technology Centre:	Irish Manufacturing Research (IMR)
Academic Mentor:	Assistant Professor Rocco Lupoi
Company Partner:	Nammo Ireland Ltd
Company Mentor:	Jim White

Mansur received his bachelor's degree in Materials & Metallurgical Engineering from Bangladesh University of Engineering & Technology, Bangladesh. In 2014, he obtained Doctor of Philosophy (PhD) degree from University of Wollongong, Australia in the field of Materials Science and Engineering. He performed research on microstructure property relationship of titanium alloys for obtaining PhD degree. Subsequently, he worked in the same institution as "Endeavour Research Fellow". In 2016, he moved to Kyushu University, Japan for doing research on fatigue and fracture of various engineering alloys. In 2019, he came to Trinity College Dublin, Ireland as research fellow to work on a spoke project co-sponsored by AMBER, J&J Centre of excellence 3D printing, USA, and DePuy Synthes Ireland. Additive manufacturing of biomedical materials was the main theme of research for this role. He also is a Professional Engineer (PEng) certified by the Engineers Australia, Australia.

Professor Rocco Lupoi

Prof. Rocco Lupoi is an innovator and academic mentor in the field of Additive Manufacturing who attempts to apply his innovation in the prospective industries. He is currently the director of Engineering with Management degree programme at Trinity College Dublin (TCD) and is the head of Cold Spray Lab. In 2019, he has been nominated as Fellow of TCD (FTCD), a prestigious award for his outstanding research achievement.

Jim White

Jim White, BEng, MEng, CEng, MIEI is a professional engineer with 15 years experience in engineering and management. He has spent his career in research and development, starting with a Master of Engineering degree by research as a Teagasc Walsh Fellow at DCU, and continuing as a research and development engineer and New Product Development Manager in subsea engineering at Cameron Ireland Ltd., and research and development engineer and Engineering Manager at Nammo Ireland Ltd.

Irish Manufacturing Research (IMR)

IMR is a leading Research and Technology Organisation providing a portfolio of research, training and consultancy services to Industry. Its vision is to enable manufacturing of all sectors and sizes to be leaders in the world of advanced manufacturing so that they can compete and thrive in the global economy. IMR's comprehensive R&D program offers collaboration across fields e.g., Digitisation, Automation & Advanced Control, Design for Manufacturing and Sustainable Manufacturing, to deliver solutions that enable industry to increase productivity, improve efficiency, upskill and build resilience, win new business and launch new products.

Nammo Ireland Ltd.

Nammo Ireland Ltd. is dedicated to design and manufacture of products for the CIVIL SPACE sector. Civil Space includes European launch vehicles, such as the Ariane 5 & 6 heavy launchers, Vega-C light launcher, commercial and scientific satellites. The current scope of products is engine support components, fluid control valves, fluid control valves, and fuel tanks. The company actively seeks to research, design and manufacture new products in cooperation with the European Space Agency and other European customers.

Mansur's Project

"Exploring New Titanium Alloys in Additive Manufacturing for Aerospace Application"

Additive manufacturing (AM) also known as 3D printing possesses significant benefits in making customised metal components. However, there is deep scientific insight required to make sure the AM produce product that are of required quality (strength, microstructure, surface) for critical use sectors such as, space, medical. The articles we see in the newspaper and news report of 3D printing do not dwell these issues/challenges- and hide the engineering and scientific work that goes on in the background, giving people a false sense of what the technology can do. Those of us in the domain are aware of the technical and scientific challenges and we are attempting to address these.

Recognising the need for detailed understanding of AM for materials such as Titanium alloys, this Career-FIT PLUS research fellow will innovate and investigate appropriate/new materials and their production parameters using additive manufacturing. The initial application domain will be mainly in Aerospace where frontiers are constantly being pushed forward with Irish based companies such as Nammo Ireland. Insight in this field will then allow for new developments in more traditional highly regulated sectors such as medical devices in companies. Through a structured scientific approach, we will "Engineer the Microstructure" of Titanium alloys such as Beta Titanium which is up to now not well understood for additive manufacturing.

With this new ability to Engineer the microstructure, it will be possible build lightweight aero components in collaboration with Nammo, and also to transfer some of this knowledge and approach to other sectors that might benefit from this insight in due course in the future with IMR. This Career-FIT PLUS project will position Ireland as a place where new AM Titanium alloys can be investigated and accelerated from concept through to product.