Looking Forward Giving Back | 1495 UNIVERSITY OF ABERDEEN DEVELOPMENT TRUST

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Introduction

Professor Javier Martín-Torres is a NASA Award-winning theoretical physicist with interdisciplinary research interests. He is one of the most widely cited planetary researchers in the world, with more than 20 years of experience working on space missions to study the atmosphere of Earth and other planets. He boasts an extensive international career that started as a Guest PhD at the University of Oxford, followed by securing a highly sought-after European Space Agency Postdoctoral Fellowship in Germany. He then spent many years based in the USA, including: seven years at the prestigious NASA Langley Research Centre, Hampton; five years at the Jet Propulsion Laboratory, Pasadena; the California Institute of Technology; the Lunar and Planetary Institute at the University of Arizona. and most recently at the Luleå University of Technology, Sweden, and the Spanish Research Council, Spain.

The University of Aberdeen's Planetary Sciences Department

Prof. Martín-Torres recently joined the University of Aberdeen, leading the Department of Planetary Sciences[i]. The Department is a high-profile, interdisciplinary group that was created as part of an ambitious strategy to enhance the University of Aberdeen's status as a world leader in research. The Group is focused on the study of Earth and other planets, and the development of instruments for environmental and planetary exploration. Their skill in building high-quality instruments for use in planetary research is already world-renowned, with their collaboration reach spanning 24 countries and 72 different institutions. Prof. Martín-Torres brings with him four senior researchers, two postdoctoral researchers and a research assistant from Luleå University of Technology[ii], Sweden, where they have spent the last six years together.

COVID-19 success

In April 2020, Prof. Martín-Torres' team hit the headlines after designing a new ventilator, ATMO-Vent[iii], for use in the fight against COVID-19, applying their expertise in life-support systems to the current health crisis on Earth. The University of Aberdeen has now signed an agreement with a medical device company in Rwanda that will assemble the ATMO-Vent for use in hospital settings in Rwanda and neighboring countries[iv].

The team has also designed an atmospheric monitoring instrument for use in future space missions to be flown aboard a balloon flight to the edge of Earth's atmosphere. The instrument known as PACKMAN will soar to 35km onboard two flights organised by the UK company B2Space[v].

Current activity

Professor Martín-Torres' current projects include:

- Principal Investigator of the space instrument HABIT[vi], designed to harvest water from the Martian atmosphere. HABIT will fly to Mars onboard the European Space Agency's ExoMars mission in 2022[vii].
- The design of experiments to analyse samples from Mars and search for life on the red planet.
- The development of In-Situ Resource Utilization Instruments. These focus on the collection, processing, storage and use of materials found or manufactured on other astronomical objects (the Moon, Mars, asteroids, etc) that may replace materials that would otherwise be brought from Earth for missions to the Moon and Mars.
- Co-Investigator for an Infrared Spectrometer, which will look at the composition of the surface mineralogy for the ExoMars mission in 2022.
- Co-Investigator of NASA´s Curiosity rover, responsible for the REMS instrument which contains all the weather instruments needed to provide daily and seasonal reports on meteorological conditions around the rover.
- Co-Investigator of the European Space Agency´s Trace Gas Orbiter and Earth Explorer 9 FORUM observation missions.
- Member of the Lunar Science Advisory Team of the European Space Agency and the Exomars Rover Science Operations Working Group.
- Reviewer for the UK Space Agency, European Research Council, NASA, European Space Agency, National Research Council (USA), National Science Foundation (USA), Consiglio Nationalle delle Ricerche (Italy), French National Center for Scientific Research, University of Tromso (Norway), National Council of Science and Technology (Mexico), and the National Fund for Scientific and Technological Research (Chile).

Honours and recognition

Prof. Martín-Torres holds Honorary Professor status at the School of Physics and Astronomy at the University of Edinburgh, Visiting Professor at the Luleå University of Technology in Sweden, and he is Specially Appointed Professor at the Institute for Planetary Materials Okayama University in Misasa, Japan. He has received several recognitions for his innovation in research and outstanding individual and group contributions to space investigation, including 5 NASA Awards, one, for 'Outstanding contributions to Space Shuttle Columbia Investigation Team'.

Prof. Martín-Torres' literature receives some of the very highest global citation rankings in Google Scholar, with his work cited in more than 14,000 other publications:

#4 in the World for Planetary Sciences citations[viii]
#5 in the World for Space Instrumentation citations[ix] and for Planetary Atmospheres citations[x]
#9 in the World for Mars citations[xi]

References

[i] Department of Planetary Sciences | School of Geosciences | The University of Aberdeen (abdn.ac.uk)

[ii] Group of Atmospheric Science (ltu.se)

[iii] Coronavirus: Aberdeen University space team develops ventilator - BBC News

[iv] University signs agreement to develop Covid-19 ventilator in Africa | News | The University of Aberdeen (abdn.ac.uk)

[v] Up, up and away - space scientists go stratospheric to test key equipment | News | The University of Aberdeen (abdn.ac.uk)

[vi] HABIT (HabitAbility: Brine, Irradiation and Temperature) - Wikipedia

[vii] University of Aberdeen aids 2022 effort to discover life on Mars | HeraldScotland

[viii]https://scholar.google.es/citations?view_op=search_authors&hl=en&authuser=1&mauthors=label:planetary_sciences

[ix]https://scholar.google.es/citations?view_op=search_authors&hl=en&authuser=1&mauthors=label:space_instrumentation

[x]https://scholar.google.es/citations?view_op=search_authors&hl=en&authuser=1&mauthors=label:planetary_atmospheres

[xi]https://scholar.google.es/citations?view_op=search_authors&hl=en&authuser=1&mauthors=label:mars