

FILIPPO CICHOCKI

Space engineer with a PhD in *plasmas and nuclear fusion*, and 12+ years of experience in R&D projects, from both industrial (4+) and researcher (8+) perspectives.

Areas of expertise

- **Cold plasmas modeling:** numerical simulations with particle-in-cell and fluid models
- **Electric propulsion thruster modeling and experiments**
- **Preliminary space missions design**

Skills

- **4 spoken languages:** Italian (native speaker), English (111/120 at TOEFL), Spanish and French
- **Software skills:** Fortran, Matlab, Python, C, Simulink, Microsoft Office, LaTeX, Open-MP and MPI parallelization techniques
- **Experimental skills:** nanosatellite subsystems, vacuum chambers, vacuum pumps, RF generators, high voltage supplies, fuel tanks, mass flow controllers, propellant feed lines, plasma diagnostics
- **Teaching skills:** keen on teaching students, with 450 lecture hours at bachelor and M.Sc. level

Professional Experience

POSTDOCTORAL RESEARCHER - since 11/2021

Istituto per la Scienza e Tecnologia dei Plasmi (ISTP), Bari, Italia

- Participation in the research programmes on *Controlled Thermonuclear Fusion* and *Sistemi e materiali complessi, materia soffice, biofisica e reti*, within the projects EUROFUSION and OROLOGIO ATOMICO, with research topic *Kinetic particle models of cold plasmas for aerospace engineering and nuclear fusion*

POSTDOCTORAL RESEARCHER - 10/2017 to 08/2019 and ASSISTANT PROFESSOR - 09/2019 to 10/2021

Universidad Carlos III de Madrid (UC3M), *Bio-Engineering and Aerospace Engineering Department, EP2 research group* (<http://ep2.uc3m.es>)

- Lecturer in 6 different *Master* and *bachelor* courses, and tutor of 4 M.Sc. theses
- Mar 2021 – Oct 2021: participation in the H2020 projects ASPIRE and CHEOPS MEDIUM POWER (<https://www.cheops-h2020.eu/grant-agreements-signed-for-cheops-phase-ii-projects/>)
- Mar 2019 – Oct 2021: technical responsible of the plasma wall interaction work package of the PROMETEO project (<https://prometeo.uc3m.es/>)
- Apr 2018 – May 2021: technical responsible of the student challenges work package of the NANOSTAR project (<https://nanostarproject.eu/es/nanostar/>)
- Nov 2016 – Apr 2020: support in software development activities and 3D Hall effect thruster plume simulations in the CHEOPS project (<https://www.cheops-h2020.eu/>)

PHD STUDENT - 10/2013 to 09/2017

Universidad Carlos III de Madrid (UC3M), Phd programme in *Plasmas and Nuclear Fusion*

- Tutor of 1 bachelor thesis and lecturer in 2 M.Sc. courses
- Formation on nuclear fusion engineering and physics through 3 dedicated courses of the *European Master of Science in Nuclear Fusion and Engineering Physics*

- 3-months PhD stay at the *Laboratoire de Physique des Plasmas (LPP)*, Ecole Polytechnique
- Technical contributions to the online EdX course *The Conquest of Space*
- **LEOSWEEP** (<https://leosweep.upm.es/en/>): development of numerical codes for the plasma-spacecraft-debris interaction in an ion beam shepherd scenario
- **IBS-IOD** (Ion Beam Shepherd In-Orbit Demonstration): electric thrusters trade-off studies
- Final PhD dissertation titled *Analysis of the expansion of a plasma thruster plume into vacuum* (<https://e-archivo.uc3m.es/handle/10016/26101>)

JUNIOR PROJECT ENGINEER - 07/2009 to 09/2013

ELECNOR DEIMOS-Space S.L.U., *Mission Analysis and Navigation* competence centre

- Different technical contributions in 9 different European space projects, among which:
 - **EXOMARS** (<http://www.elecnor-deimos.com/es/portfolio/exomars-es/>) phases B2 & C
 - **Robust and Autonomous Aerobraking Strategies (RAAS)**
 - **Mars Sample Return Aerobraking (MSRAB)**
 - **MARCOPOLO-R** (<https://www-n.oca.eu/MarcoPolo-R/>)
 - **SSA-SN-VII** (<https://indico.esa.int/event/68/contributions/3116/>)
 - **NEOSHIELD** (<https://doi.org/10.1016/j.actaastro.2012.08.026>)

Education

UNIVERSITY SAPIENZA, ROME

- Bachelor's Degree in **Aerospace Engineering** (110/110 cum laude) - 09/2003 to 09/2006
- Master of Science Degree in **Space Engineering** (110/110 cum laude) - 09/2006 to 03/2009
- PhD in *Plasmas and Nuclear Fusion* (cum laude) - 10/2013 to 09/2017

Publications, reviews and prizes

- **11 publications** and **16 verified reviews** in peer-review journals (<https://publons.com/researcher/1543532/filippo-cichocki/>)
- **31 contributions** in international conferences (papers, posters, presentations)
- **Review editor** for **Frontiers in Physics** (<https://loop.frontiersin.org/people/876077/overview>), with specialty in *Plasma physics*. Active editor of the research topic *Numerical Simulations of Plasma Thrusters and/or Related Technologies*
- **2016-2017 Extraordinary PhD Award** of the university Carlos III de Madrid
- **Top-5 publications:**
 - F. Cichocki et al., *Three-dimensional neutralizer effects on a Hall-effect thruster near plume*, Acta Astronautica, Vol. 187, pages 498-510, 2021
 - F. Cichocki et al., *Three-dimensional geomagnetic field effects on a plasma thruster plume expansion*, Acta Astronautica, Vol. 175, pages 190-203, 2020
 - F. Cichocki et al., *Spacecraft-plasma-debris interaction in an ion beam shepherd mission*, Acta Astronautica, Vol. 146, pages 216-227, 2018
 - F. Cichocki et al., *Hybrid 3D model for the interaction of plasma thruster plumes with nearby objects*, Plasma Sources Sciences and Technologies, Vol. 26, N.12, pages 125008, 2017
 - M. Merino et al., *A collisionless plasma thruster plume expansion model*, Plasma Sources Sciences and Technologies, Vol. 24, N. 3, pages 035006, 2015