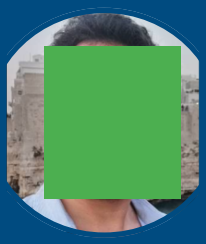
europass



Mirko Magarotto

[redacted]r:

WORK EXPERIENCE

01/02/2023 – CURRENT Padova, Italy
RICERCATORE A TEMPO DETERMINATO DI TIPO A (RTDA) UNIVERSITY OF PADOVA

Gruppo Scientifico Disciplinare: 09/IINF-02 CAMPI ELETTROMAGNETICI
Settore Scientifico Disciplinare: IINF-02/A Campi elettromagnetici
Major: Electromagnetic Fields

The research focuses on high-frequency electromagnetic fields, antenna modeling and characterization, as well as the study of metasurfaces and metamaterials, conducted within the framework of Italy's National Recovery and Resilience Plan (NRRP) under the NextGenerationEU program, "RESTART."
A key emphasis is placed on the development of **plasma-based Intelligent Reflecting Surfaces (IRS)**.

Department of Information Engineering (DEI)

31/12/2021 – 31/12/2022 Padova, Italy
ASSEGNO DI RICERCA (POST-DOC RESEARCH FELLOW) UNIVERSITY OF PADOVA

Analysis, design, and characterization of **plasma antennas** and electric propulsion systems utilizing plasma mixtures, carried out as part of the Uni-Impresa 2019 project, PlasMix4Space.

Department of Industrial Engineering (DII)

Supervisor: Prof. Daniele Pavarin

30/09/2021 – 30/12/2021 Padova, Italy
BORSA DI RICERCA (RESEARCH SCHOLARSHIP) UNIVERSITY OF PADOVA

Optimization of the performance of a Helicon plasma thruster via the design of the magnetic field geometry.

Centre of Studies and Activities for Space (CISAS) "G. Colombo"

Supervisor: Dr. Francesco Barato

30/09/2020 – 29/09/2021 Padova, Italy
ASSEGNO DI RICERCA (POST-DOC RESEARCH FELLOW) UNIVERSITY OF PADOVA

Analysis, design, and characterization of **plasma antennas** and electric propulsion systems utilizing plasma mixtures, carried out as part of the Uni-Impresa 2019 project, PlasMix4Space.

Department of Industrial Engineering (DII)

Supervisor: Prof. Daniele Pavarin

30/09/2018 – 29/09/2020 Padova, Italy
ASSEGNO DI RICERCA (POST-DOC RESEARCH FELLOW) UNIVERSITY OF PADOVA

Numerical and experimental characterization of plasma sources and **plasma antennas** as part of the project "Antenna al Plasma – Enabling Technology for SATCOM," funded by the Italian Space Agency (ASI).

Centre of Studies and Activities for Space (CISAS) "G. Colombo"

Supervisor: Prof. Daniele Pavarin

30/09/2018 – 31/12/2022 Monselice, Italy
CONSULTANT ENGINEER TECHNOLOGY FOR PROPULSION AND INNOVATION SPA

Supervising the development of numerical models for the simulation of plasma dynamics and electromagnetic wave propagation in **plasma antennas** and electric propulsion systems.

09/2020 – 09/2021 Thessaloniki, Greece
VISITING POST-DOC RESEARCH FELLOW ARISTOTELES UNIVERSITY OF THESSALONIKI

4 cumulative months in the frame of the PATH project on **plasma antennas**.

06/2019 – 12/2019 Shanghai, China
VISITING POST-DOC RERSEARCH FELLOW UNIVERSITY OF SHANGHAI

1 cumulative month in the frame of the PATH project on **plasma antennas**.

09/2018 – 02/2020 Southampton, United Kingdom
VISITING POST-DOC RESEARCH FELLOW MARS SPACE LTD

4 cumulative months in the frame of the PATH project on **plasma antennas**.

07/2017 – 09/2018 Southampton, United Kingdom
VISITING PHD STUDENT MARS SPACE LTD

3 cumulative months the frame of the PATH project on **plasma antennas**.

EDUCATION AND TRAINING

30/09/2015 – 29/09/2018 Padova, Italy
PHILOSOPHIAE DOCTOR (PHD) University of Padova

Design and development of a high-power Helicon plasma source for space applications. A 3D code, 3D-VIRTUS, was developed to self-consistently analyze plasma transport and **electromagnetic wave propagation** within plasma sources. Extensive experience gained in the operation of electrostatic probes, thrust stands, interferometers, and Vector Network Analyzers (VNA). Participation in key projects includes: (i) SAPERE STRONG, funded by MIUR, focused on developing a 1kW Helicon plasma thruster, and (ii) PATH H2020-MSCA-RISE-2016 (ID 734629), aimed at advancing **plasma antennas** enhancing the performance of high-density plasma sources.

Centre of Studies and Activities for Space (CISAS) "G. Colombo"

Supervisors: Dr. Davide Melazzi, Prof. Daniele Pavarin

Address Via VIII Febbraio 2, 35122, Padova, Italy | **Field of study** Sciences, Technologies and Measurements for Space |

Thesis Numerical and experimental investigation into the performance of plasma sources for space propulsion systems

12/2015 Padova, Italy
ABILITAZIONE ALLA PROFESSIONE DI INGEGNERE INDUSTRIALE (LICENSED AS PROFESSIONAL INDUSTRIAL ENGINEER) University of Padova

Address Via VIII Febbraio, 2, 35122, Padova, Italy

30/09/2013 – 16/09/2015 Padova, Italy
LAUREA MAGISTRALE (MASTER'S DEGREE) University of Padova

Development of a self-consistent numerical tool for studying Helicon plasma sources, achieved by coupling an **electromagnetic solver** with 0D and 1D radial fluid models for plasma transport.

Supervisors: Prof. Daniele Pavarin, Dr. Davide Melazzi, Dr. Marco Manente

Address Via VIII Febbraio 2, 35122, Padova, Italy | **Field of study** Aerospace Engineering | **Final grade** 110/110 cum Laude |

Thesis Numerical Investigation into the Power Deposition and Transport Phenomena in Helicon Plasma Sources

30/09/2010 – 21/07/2013 Padova, Italy
LAUREA (BACHELOR DEGREE) University of Padova

Address Via VIII Febbraio 2, 35122, Padova, Italy | **Field of study** Aerospace Engineering | **Final grade** 110/110 cum Laude

08/2021
SUMMER SCHOOL (PATH PROJECT) Technical University of Crete, Chania, GR

Summer School organized in the frame of the PATH project on **plasma antennas**.

06/2019
SUMMER SCHOOL (PATH PROJECT) University of Shanghai, Shanghai, CN

Summer School organized in the frame of the PATH project on **plasma antennas**.

06/2018
SUMMER SCHOOL (PATH PROJECT) University of Padova, Padova, IT

Summer School organized in the frame of the PATH project on **plasma antennas**.

07/2017
SUMMER SCHOOL (PATH PROJECT) University of Southampton, Southampton, UK

Summer School organized in the frame of the PATH project on **plasma antennas**.

PUBLICATION METRICS

10/2024
H index

Scopus 18
Google scholar 19

10/2024
Citations

Scopus 774 (765 in the last 5 years)
Google scholar 1011

09/2024
Publications

Indexed Scopus
Journal papers 41
Conference papers 27
Book chapter 1
(59 documents in the last 5 years)

Not indexed Scopus
Conference papers 30

PUBLICATIONS

2024
Cathode-less RF plasma thruster design and optimisation for an atmosphere-breathing electric propulsion (ABEP) system

S. Andrews, R: Andriulli, N. Souhair, **M. Magarotto**, F. Ponti, "Cathode-less RF plasma thruster design and optimisation for an atmosphere-breathing electric propulsion (ABEP) system", Acta Astronautica 255 (2024): 833-844, ISSN 0094-5765

Contribution:
Supervision of the code development, physical analysis, writing

Journal paper

2024
Predicting the antenna properties of helicon plasma thrusters using machine learning techniques

O. Malm, N. Souhair, A. Rossi, **M. Magarotto**, F. Ponti, "Predicting the antenna properties of helicon plasma thrusters using machine learning techniques", Journal of Electric Propulsion 3.1 (2024): 6, ISSN 2731-4596

Contribution:
Physical analysis, methodology

Journal paper

2024
Cylindrical Metasurface-Cladded Waveguide filled with Positive- or Negative-Epsilon Dielectric

M. Magarotto, L. Schenato, M. Santagiustina, A. Galtarossa, A.-D. Capobianco, "Cylindrical Metasurface-Cladded Waveguide filled with Positive- or Negative-Epsilon Dielectric", IEEE Access 12 (2024): 124537-124548, ISSN 2169-3536

Contribution: **first author**, **corresponding author**
Conceived the cylindrical waveguide, numerical model, simulations, writing

Journal paper

2024
Plasma Antennas: A Comprehensive Review

M. Magarotto, F. Sadeghikia, L. Schenato, D. Rocco, M. Santagiustina, A. Galtarossa, A. K. Horestani, A.-D. Capobianco, "Plasma Antennas: A Comprehensive Review", IEEE Access 12 (2024): 80468-80490, ISSN 2169-3536

Contribution: **first author**, **corresponding author**
Literature review, organize data, writing

Journal paper

2024
Cylindrical Waveguides for Microwave Spoof Surface Plasmon Polaritons

M. Magarotto, L. Schenato, G. Franchin, M. Santagiustina, A. Galtarossa, A.-D. Capobianco, "Cylindrical Waveguides for Microwave Spoof Surface Plasmon Polaritons", IEEE Access 12 (2024): 23190-23199, ISSN 2169-3536

Contribution: **first author**, **corresponding author**
Conceived the cylindrical waveguide, numerical model, simulations, writing

Journal paper

2024
Fully kinetic study of facility pressure effects on RF-source magnetic nozzles

R. Andriulli, S. Andrews, N. Souhair, **M. Magarotto**, F. Ponti, "Fully kinetic study of facility pressure effects on RF-source magnetic nozzles", Acta Astronautica 215 (2024): 362-372, ISSN 0094-5765

Contribution:
Supervision of the code development, physical analysis, writing

Journal paper

2023
Plasma-Based Dual-Band Reflective Surface

M. Magarotto, L. Schenato, M. Santagiustina, A. Galtarossa, A.-D. Capobianco, "Plasma-Based Dual-Band Reflective Surface", IEEE Access 11 (2023): 128970-128978, ISSN 2169-3536

Contribution: **first author**, **corresponding author**
Conceived plasma-based Intelligent Reflecting Surfaces, numerical model, simulations, writing

Journal paper

2023
A reflective metalens with tunable focal length for millimeter waves

M. A. Shameli, **M. Magarotto**, A.-D. Capobianco, L. Schenato, M. Santagiustina, D. de Ceglia, "A reflective metalens with tunable focal length for millimeter waves", IEEE Access 11 (2023): 104191-104199, ISSN 2169-3536

Contribution: **second author**
Methodology, data analysis, writing

Journal paper

2023
Products, reactive species and mechanisms of PFOA degradation in a self-pulsing discharge (SPD) plasma reactor

O. Biondo, G. Tomei, M. Saleem, G. B. Sretenović, **M. Magarotto**, E. Marotta, C. Paradisi, "Products, reactive species and mechanisms of PFOA degradation in a self-pulsing discharge (SPD) plasma reactor", Chemosphere 341 (2023): 139972, ISSN 0045-6535

Contribution:

Plasma reactor development, data analysis

Journal paper

2023
Plasma-Based Reflecting and Transmitting Surfaces

M. Magarotto, L. Schenato, M. Santagiustina, A. Galtarossa, A.-D. Capobianco, "Plasma-Based Reflecting and Transmitting Surfaces", IEEE Access 11 (2023): 91196-91205, ISSN 2169-3536

Contribution: **first author**, **corresponding author**
Conceived plasma-based Intelligent Reflecting Surfaces, numerical model, simulations, writing

Journal paper

2023
Magnetic nozzle performance in a cluster of helicon plasma thrusters

S. Di Fede, M. Manente, P. Comunian, **M. Magarotto**, "Magnetic nozzle performance in a cluster of helicon plasma thrusters", Plasma Sources Science and Technology 32.6 (2023): 065013, ISSN 0963-0252

Contribution: **last author**
Supervision of the code development, physical analysis, writing

Journal paper

2023
Plasma-Based Intelligent Reflecting Surface for Beam-Steering and Polarisation Conversion

M. Magarotto, L. Schenato, M. Santagiustina, A. Galtarossa, A.-D. Capobianco, "Plasma-Based Intelligent Reflecting Surface for Beam-Steering and Polarisation Conversion", IEEE Access 11 (2023): 43546-43556, ISSN 2169-3536

Contribution: **first author**, **corresponding author**
Conceived plasma-based Intelligent Reflecting Surfaces, numerical model, simulations, writing

Journal paper

2023
Development of a Global Model for the Analysis of Plasma in an Atmosphere-Breathing Cathode-Less Thruster

S. Dalle Fabbriche, N. Souhair, **M. Magarotto**, R. Andriulli, E. Corti, F. Ponti, "Development of a Global Model for the Analysis of Plasma in an Atmosphere-Breathing Cathode-Less Thruster", Aerospace 10.5 (2023): 389, ISSN 2226-4310

Contribution:
Theoretical model, methodology, physical analysis

Journal paper

2023
Design of a plasma-based intelligent reflecting surface

M. Magarotto, L. Schenato, P. De Carlo, M. Santagiustina, A. Galtarossa, A.-D. Capobianco, "Design of a plasma-based intelligent reflecting surface", Physics of Plasmas 30.4 (2023): 043509, ISSN 1070-664X

Contribution: **first author**, **corresponding author**
Conceived plasma-based Intelligent Reflecting Surfaces, numerical model, simulations, writing

Journal paper

2023
Feasibility study on a plasma based reflective surface for SatCom systems

M. Magarotto, P. De Carlo, L. Schenato, M. Santagiustina, A. Galtarossa, D. Pavarin, A.-D. Capobianco, "Feasibility study on a plasma based reflective surface for SatCom systems", Acta Astronautica 208 (2023): 55-61, ISSN 0094-5765

Contribution: **first author**, **corresponding author**
Conceived plasma-based Intelligent Reflecting Surfaces, numerical model, simulations, writing

Journal paper

2023
Coupled Global and PIC Modelling of the REGULUS Cathode-less Plasma Thrusters Operating on Xenon, Iodine and Krypton

S. Andrews, R. Andriulli, N. Souhair, S. Di Fede, D. Pavarin, F. Ponti, **M. Magarotto**, "Coupled global and PIC modelling of the REGULUS cathode-less plasma thrusters operating on xenon, iodine and krypton", Acta Astronautica 207 (2023): 227-239, ISSN 0094-5765

Contribution: **last author**
Supervision of the code development, physical analysis, writing

Journal paper

2023
Plasma-Based Reflective Surface for Polarization Conversion

M. Magarotto, L. Schenato, P. De Carlo, A.-D. Capobianco, "Plasma-Based Reflective Surface for Polarization Conversion", IEEE Transactions on Antennas and Propagation 71.3 (2023): 2849 - 2854, ISSN 1558-2221

Contribution: **first author**, **corresponding author**
Conceived plasma-based Intelligent Reflective Surfaces, theoretical model, simulations, writing

Journal paper

2023
Prediction of the Propulsive Performance of an Atmosphere-Breathing Electric Propulsion System on Cathode-Less Plasma Thruster

N. Souhair, **M. Magarotto**, R. Andriulli, F. Ponti, "Prediction of the Propulsive Performance of an Atmosphere-Breathing Electric Propulsion System on Cathode-Less Plasma Thruster", Aerospace 10.2 (2023): 100, ISSN 2226-4310

Contribution: **second author**
Theoretical model, methodology, physical analysis

Journal paper

2023
Different fluid strategies for the simulation of a Helicon Plasma Thruster

N. Souhair, F. Ponti, **M. Magarotto**, D. Pavarin, "Different fluid strategies for the simulation of a Helicon Plasma Thruster", Contributions to Plasma Physics 63.2 (2023): e202200128, ISSN 1521-3986

Contribution:
Theoretical model, methodology, physical analysis

Journal paper

2022
Feasibility of a Plasma-Based Intelligent Reflective Surface

M. Magarotto, L. Schenato, P. De Carlo, A.-D. Capobianco, "Feasibility of a Plasma-Based Intelligent Reflective Surface", IEEE Access 10 (2022): 97995 - 98003, ISSN 2169-3536

Contribution: **first author**, **corresponding author**
Conceived plasma-based Intelligent Reflecting Surfaces, theoretical model, simulations, writing

Journal paper

2022
Numerical suite for cathodeless plasma thrusters

M. Magarotto, S. Di Fede, N. Souhair, S. Andrews, F. Ponti, "Numerical suite for cathodeless plasma thrusters", Acta Astronautica 197 (2022): 126-138, ISSN 0094-5765

Contribution: **first author**, **corresponding author**
Supervision of the codes development, simulation of the electromagnetic wave propagation and plasma dynamics, physical analysis, writing

Journal paper

2022
Fully kinetic model of plasma expansion in a magnetic nozzle

S. Andrews, S. Di Fede, **M. Magarotto**, "Fully kinetic model of plasma expansion in a magnetic nozzle", Plasma Sources Science and Technology 31.3 (2022): 035022, ISSN 0963-0252

Contribution: **last author**
Supervision of the code development, physical analysis, writing

Journal paper

2022
Design of a Hybrid Metal-Plasma Transmit-Array with Beam-Scanning Capabilities

G. Mansutti, P. De Carlo, **M. Magarotto**, M. A. Hannan, P. Rocca, A.-D. Capobianco, D. Pavarin, A. Tuozzi, "Design of a Hybrid Metal-Plasma Transmit-Array with Beam-Scanning Capabilities", IEEE Transactions on Plasma Science 50.3 (2022): 662-669, ISSN 0093-3813

Contribution:
Plasma measures, antenna simulation, writing

Journal paper

2022
Semi-analytical Model of a Helicon Plasma Thruster

M. Guaita, **M. Magarotto**, M. Manente, D. Pavarin, M. Lavagna, "Semi-analytical Model of a Helicon Plasma Thruster", IEEE Transactions on Plasma Science 50.2 (2022): 425-438, ISSN 0093-3813

Contribution: **second author**
Supervision of the code development, physical analysis, writing

Journal paper

2022
Design and In-orbit Demonstration of REGULUS, an Iodine electric propulsion system

N. Bellomo, **M. Magarotto**, M. Manente, F. Trezzolani, R. Mantellato, L. Cappellini, D. Paulon, A. Selmo, D. Scalzi, M. Minute, M. Duzzi, A. Barbato, A. Schiavon, S. Di Fede, N. Souhair, P. De Carlo, F. Barato, F. Milza, E. Toson, D. Pavarin, "Design and In-orbit Demonstration of REGULUS, an Iodine electric propulsion system", CEAS Space J 14.1 (2022): 79-90, ISSN 1868-2502

Contribution: **corresponding author, second author**
Design of the thruster via simulations of the electromagnetic wave propagation and plasma dynamics, writing

Journal paper

2021
Simulation of the plume of a Magnetically Enhanced Plasma Thruster with SPIS

S. Di Fede, **M. Magarotto**, S. Andrews, D. Pavarin, "Simulation of the plume of a Magnetically Enhanced Plasma Thruster with SPIS", Journal of Plasma Physics 87.6 (2021): 905870611, ISSN 0022-3778

Contribution: **second author**
Supervision of the code development, physical analysis, writing

Journal paper

2021
Analysis of the plasma transport in numerical simulations of helicon plasma thrusters

N. Souhair, **M. Magarotto**, F. Ponti, D. Pavarin, "Analysis of the plasma transport in numerical simulations of helicon plasma thrusters", AIP Advances 11.11 (2021): 115016, ISSN 2158-3226

Contribution: **second author**
Supervision of the code development, physical analysis, writing

Journal paper

2021
Development of a lumping methodology for the analysis of the excited states in plasma discharges operated with argon, neon, krypton, and xenon

N. Souhair, **M. Magarotto**, E. Majorana, F. Ponti, D. Pavarin, "Development of a lumping methodology for the analysis of the excited states in plasma discharges operated with argon, neon, krypton, and xenon", Physics of Plasmas 28.9 (2021): 093504, ISSN 1070-664X

Contribution: **second author**
Supervision of the code development, physical analysis, writing

Journal paper

2021
Experimental Characterization of a Plasma Dipole in the UHF band

P. De Carlo, **M. Magarotto**, G. Mansutti, S. Boscolo, A.-D. Capobianco, D. Pavarin, "Experimental Characterization of a Plasma Dipole in the UHF band", IEEE Antennas and Wireless Propagation Letters 20.9 (2021): 1621-1625, ISSN 1536-1225

Contribution: **corresponding author, second author**
Plasma source development and measures, antenna development and measures, writing

Journal paper

2021
Numerical Suite for Gaseous Plasma Antennas Simulation

M. Magarotto, P. De Carlo, G. Mansutti, F. J. Bosi, N. E. Buris, A.-D. Capobianco, D. Pavarin, "Numerical Suite for Gaseous Plasma Antennas Simulation", IEEE Transactions on Plasma Science 49.1 (2021): 285-297, ISSN 0093-3813

Contribution: **first author, corresponding author**
Development of the code to simulate the plasma transport in a plasma source, antenna simulations, plasma measures, writing

Journal paper

2021
Feasibility study of a novel class of plasma antennas for SatCom navigation systems

P. de Carlo, **M. Magarotto**, G. Mansutti, A. Selmo, A.-D. Capobianco, D. Pavarin, "Feasibility study of a novel class of plasma antennas for SatCom navigation systems", Acta Astronautica 178 (2021): 846-853, ISSN 0094-5765

Contribution: **corresponding author, second author**
Plasma source development and measures, antenna simulations, writing

Journal paper

2020
Characterisation of a thermionic plasma source apparatus for high-density gaseous plasma antenna applications

A. Daykin-Iliopoulos, F. J. Bosi, F. Coccaro, **M. Magarotto**, A. Papadimopoulos, P. De Carlo, C. Dobranszki, I. O. Golosnoy, S. Gabriel, "Characterisation of a thermionic plasma source apparatus for high-density gaseous plasma antenna applications", Plasma Sources Science and Technology 29.11 (2020): 115002, ISSN 0963-0252

Contribution:
Antenna simulation, literature review, writing

Journal paper

2020
Parametric Study of a Cathode-Less Radio Frequency Thruster

M. Magarotto, D. Pavarin, "Parametric Study of a Cathode-Less Radio Frequency Thruster," IEEE Transactions on Plasma Science 48.8 (2020): 2723-2735, ISSN 0093-3813

Contribution: **first author**, **corresponding author**
Development of the code to simulate the electromagnetic wave propagation and plasma dynamics in a plasma source, simulations, writing

Journal paper

2020
Numerical Model of a Helicon Plasma Thruster

M. Magarotto, M. Manente, F. Trezzolani, D. Pavarin, "Numerical Model of a Helicon Plasma Thruster." IEEE Transactions on Plasma Science 48.4 (2020): 835-844, ISSN 0093-3813

Contribution: **first author**, **corresponding author**
Development of the code to simulate the electromagnetic wave propagation and plasma dynamics, simulations, measures, writing

Journal paper

2020
Modeling and design of a plasma-based transmit-array with beam scanning capabilities

G. Mansutti, P. De Carlo, M. A. Hannan, F. Boulos, P. Rocca, A.-D. Capobianco, **M. Magarotto**, A. Tuozzi, "Modeling and design of a plasma-based transmit-array with beam scanning capabilities." Results in Physics 16 (2020): 102923, ISSN 2211-3797

Contribution:
Plasma source development, literature review, writing

Journal paper

2020
Comparative performance assessment of plasma reactors for the treatment of PFOA; reactor design, kinetics, mineralization and energy yield

M. Saleem, O. Biondo, G. B. Sretenovic, G. Tomei, **M. Magarotto**, D. Pavarin, E. Marotta, C. Paradisi, "Comparative performance assessment of plasma reactors for the treatment of PFOA; reactor design, kinetics, mineralization and energy yield." Chemical Engineering Journal 382 (2020): 123031, ISSN 1385-8947

Contribution:
Plasma reactor development, literature review, writing

Journal paper

2020
3D-VIRTUS: Equilibrium condition solver of radio-frequency magnetized plasma discharges for space applications

M. Magarotto, D. Melazzi, D. Pavarin, "3D-VIRTUS: Equilibrium condition solver of radio-frequency magnetized plasma discharges for space applications." Computer Physics Communications 247 (2020): 106953, ISSN 0010-4655

Contribution: **first author**, **corresponding author**
Development of the code to simulate the electromagnetic wave propagation and plasma dynamics in a plasma source, simulations, writing

Journal paper

2019
Study on the influence of the magnetic field geometry on the power deposition in a helicon plasma source

M. Magarotto, D. Melazzi, D. Pavarin, "Study on the influence of the magnetic field geometry on the power deposition in a helicon plasma source", Journal of Plasma Physics 85.4 (2019): 905850404, ISSN 0022-3778

Contribution: **first author**, **corresponding author**
Development of the Finite Difference Frequency Domain code to simulate wave propagation in a plasma source, simulations, writing

Journal paper

2019
Enhanced biDimensional pIc: an electrostatic/magnetostatic particle-in-cell code for plasma based systems

G. Gallina, **M. Magarotto**, M. Manente, D. Pavarin, "Enhanced biDimensional pIc: an electrostatic/magnetostatic particle-in-cell code for plasma based systems", Journal of Plasma Physics 85.2 (2019): 905850205, ISSN 0022-3778

Contribution: **corresponding author, second author**
Simulations, literature review, writing

Journal paper

2019
REGULUS: A propulsion platform to boost small satellite missions

M. Manente, F. Trezzolani, **M. Magarotto**, E. Fantino, A. Selmo, N. Bellomo, E. Toson, D. Pavarin, "REGULUS: A propulsion platform to boost small satellite missions", Acta Astronautica 157 (2019): 241-249, ISSN 0094-5765

Contribution: **corresponding author**
Design of the thruster via simulations of the electromagnetic wave propagation and plasma dynamics, writing

Journal paper

2018
Development of a counterbalanced pendulum thrust stand for electric propulsion

F. Trezzolani, **M. Magarotto**, M. Manente, D. Pavarin, "Development of a counterbalanced pendulum thrust stand for electric propulsion", Measurement 122 (2018): 494-501, ISSN 0263-2241

Contribution: **corresponding author, second author**
Measures, algorithms, writing

Journal paper

2023
Electric propulsion systems

M. Manente, **M. Magarotto**, "Electric propulsion systems", Next Generation CubeSats and SmallSats (2023), Chap. 20, 485-517, Elsevier, Amsterdam, ND: ISBN 978-0-12-824541-5

Contribution: **last author**
Literature review, data analysis, writing

Book chapter

2024
Self-consistent Coupling of Fluid and PIC Codes

W. van Lynden, R. Andriulli, F. Ponti, **M. Magarotto**, F. Cescon, N. Souhair, S. Di Fede, "Self-consistent Coupling of Fluid and PIC Codes", IEPC-2024-130, 38th International Electric Propulsion Conference (IEPC), Toulouse, FR, 2024

Conference paper

2024
Metamaterials for Electric Propulsion

M. Magarotto, L. Schenato, A. Capobianco, "Metamaterials for Electric Propulsion", IEPC-2024-134, 38th International Electric Propulsion Conference (IEPC), Toulouse, FR, 2024

Conference paper

2024
Advancing Iodine Thruster Technology: Insights and Objectives of Project BOOST

F. Ponti, N. Souhair. R. Andriulli, F. Felicioni, G. Silvagni, **M Magarotto**, et al., "Advancing Iodine Thruster Technology: Insights and Objectives of Project BOOST", IEPC-2024-310, 38th International Electric Propulsion Conference (IEPC), Toulouse, FR, 2024

Conference paper

2024
Cluster of Magnetic Nozzles: A Fully Kinetic 3D PIC Simulation Study

F. Cescon, S. Di Fede, M. Manente, **M. Magarotto**, "Cluster of Magnetic Nozzles: A Fully Kinetic 3D PIC Simulation Study", IEPC-2024-415, 38th International Electric Propulsion Conference (IEPC), Toulouse, FR, 2024

Conference paper

2024
A Self-Consistent Drift-Dissipative Instability Model of Anomalous Transport in the Magnetic Nozzle

S. Andrews, R. Andriulli, F. Ponti, N. Souhair, **M. Magarotto**, "A Self-Consistent Drift-Dissipative Instability Model of Anomalous Transport in the Magnetic Nozzle", IEPC-2024-810, 38th International Electric Propulsion Conference (IEPC), Toulouse, FR, 2024

Conference paper

2024
Self-consistent Coupling of Fluid and PIC Codes

W. van Lynden, N. Souhaira, R. Andriulli, F. Cescon, S. Di Fede, F. Ponti, **M. Magarotto**, "Self-consistent Coupling of Fluid and PIC Codes", SP2024-139, 9th Space Propulsion Cerence (SP2024), Glasgow, UK, 2024

Conference paper

2024
Building Blocks for Iodine Thrusters: Perspective and Targets of the Project BOOST

F. Ponti, N. Souhair, R. Andriulli, F. Felicioni, **M. Magarotto**, et al., "Building Blocks for Iodine Thrusters: Perspective and Targets of the Project BOOST", SP2024-539, 9th Space Propulsion Cerence (SP2024), Glasgow, UK, 2024

Conference paper

2024
Recent Advances in Plasma Surfaces

M. Magarotto, L. Schenato, M. Santagiustina, A. Galtarossa, A.-D. Capobianco, "Recent Advances in Plasma Surfaces", 18th European Conference on Antennas and Propagation (EuCAP), 1570962694, Glasgow, UK, 2024, ISBN 978-883129907-7

Conference paper

2024

Tunable Rectangular Waveguide Bandpass Filter Based on Plasma Technology

A. Ashrafian, F. Sadeghikia, J. A. R. Mohassel, M. Himdi, M. Magarotto, "Tunable Rectangular Waveguide Bandpass Filter Based on Plasma Technology", 18th European Conference on Antennas and Propagation (EuCAP), 1570965070, Glasgow, UK, 2024, ISBN 978-883129907-7

Conference paper

2023

Preliminary analysis of polarization effects in bent uncoupled-core multicore fibers

M. Cappelletti, D. Orsuti, M. H. Vandborg, A. Aitkulov, P. Del Olmo, L. Schenato, **M. Magarotto**, M. Santagiustina, C. Antonelli, A. Mecozzi, T. Hayashi, L. Grüner-Nielsen, "Preliminary analysis of polarization effects in bent uncoupled-core multicore fibers", 28th International Conference on Optical Fiber Sensors (OFS), Hamamatsu J, 2023

Conference paper

2023

Simultaneous Core Interrogation in Fiber Optic Shape Sensing via Rayleigh Signature-domain Multiplexing

M. Cappelletti, A. Aitkulov, D. Orsuti, L. Schenato, M. Santagiustina, **M. Magarotto**, C. Antonelli, A. Galtarossa, A. Mecozzi, T. Hayashi, L. Palmieri, "Simultaneous Core Interrogation in Fiber Optic Shape Sensing via Rayleigh Signature-domain Multiplexing", 28th International Conference on Optical Fiber Sensors (OFS), Hamamatsu J, 2023

Conference paper

2023

Multi-core Fibers as a Technological Platform for Distributed Twist Sensing

D. Orsuti, A. Aitkulov, M. Cappelletti, L. Schenato, **M. Magarotto**, M. Santagiustina, C. Antonelli, A. Mecozzi, T. Hayashi, A. Galtarossa, L. Palmieri, "Multi-core Fibers as a Technological Platform for Distributed Twist Sensing", 28th International Conference on Optical Fiber Sensors (OFS), Hamamatsu J, 2023

Conference paper

2023

Numerical suite for the design, simulation and optimization of cathode-less plasma thrusters

N. Souhair, **M. Magarotto**, R. Andriulli, F. Ponti, "Numerical suite for the design, simulation and optimization of cathode-less plasma thrusters", 27th Congress of the Italian Association of Aeronautics and Astronautics (AIDAA), Padova, IT, 2023, Materials Research Proceedings, 37: 679 - 689, ISSN 2474-3941

Conference paper

2023

KEYNOTE: X-band Plasma-Based Reflective Surface

M. Magarotto, L. Schenato, N. Souhair, F. Ponti, F. Milza, P. De Carlo, D. Pavarin, M. Santagiustina, A.-D. Capobianco, "KEYNOTE: X-band Plasma-Based Reflective Surface", IAC-23-B2.6.1-x76494, 74th International Astronautical Congress (IAC), Baku, AZ, 2023, ISSN 0074-1795

Conference paper

2023

Novel Coupling Methods for Fluid and Kinetic Solvers in the numerical modeling of Helicon Plasma Thrusters

W. van Lynden, N. Souhair, R. Andriulli, **M. Magarotto**, S. Andrews, A. Cervone, F. Ponti, "Novel Coupling Methods for Fluid and Kinetic Solvers in the numerical modeling of Helicon Plasma Thrusters", IAC-23-C4.6.5-x77868, 74th International Astronautical Congress (IAC), Baku, AZ, 2023, ISSN 0074-1795

Conference paper

2023

Modelling and design of Earth and Mars atmosphere-breathing electric propulsion systems (ABEP) using a cathode-less RF thruster

R. Andriulli, S. Andrews, N. Souhair, **M. Magarotto**, F. Ponti, "Modelling and design of Earth and Mars atmosphere-breathing electric propulsion systems (ABEP) using a cathode-less RF thruster", IAC-23,C4,5,10,x77484, 74th International Astronautical Congress (IAC), Baku, AZ, 2023, ISSN 0074-1795

Conference paper

2023

Atmosphere-Breathing Electric Propulsion (ABEP) System using a Cathode-Less RF Plasma Thruster: Design and Robust Optimisation for VLEO

S. Andrews, R. Andriulli, N. Souhair, **M. Magarotto**, F. Ponti, "Atmosphere-Breathing Electric Propulsion (ABEP) System using a Cathode-Less RF Plasma Thruster: Design and Robust Optimisation for VLEO", IAC-23,C4,9,3,x77511, 74th International Astronautical Congress (IAC), Baku, AZ, 2023, ISSN 0074-1795

Conference paper

2023

Statistical Characterization of Modal Dispersion in Field-Deployed Multi-Core Fiber

M. Cappelletti, D. Orsuti, M. Mazur, N. Fontaine, R. Ryf, T. Hayashi, **M. Magarotto**, A. Mecozzi, M. Santagiustina, A. Galtarossa, C. Antonelli, L. Palmieri, "Statistical Characterization of Modal Dispersion in Field-Deployed Multi-Core Fiber", 49th European Conference on Optical Communications (ECOC), IET Conference Proceedings (34) 590-593, Glasgow, UK, 2023, ISSN 2732-4494.

Conference paper

2023

Edge-Carrier-Assisted Phase Retrieval Receivers Based on Alternative Projections: Performance and Complexity Analysis

D. Orsuti, M. Cappelletti, **M. Magarotto**, M. Santagiustina, A. Galtarossa, L. Palmieri, "Edge-Carrier-Assisted Phase Retrieval Receivers Based on Alternative Projections: Performance and Complexity Analysis", 49th European Conference on Optical Communications (ECOC), IET Conference Proceedings (34) 578-581, Glasgow, UK, 2023, ISSN 2732-4494.

2023

Fiber signature-domain multiplexing for high-speed shape sensing

M. Cappelletti, A. Aitkulov, D. Orsuti, L. Schenato, M. Santagiustina, **M. Magarotto**, C. Antonelli, A. Galtarossa, A. Mecozzi, T. Hayashi, L. Palmieri "Fiber signature-domain multiplexing for high-speed shape sensing", Proc. SPIE 12643, European Workshop on Optical Fibre Sensors (EWOFS 2023), 126431W, Mons, BE, 2023, ISBN 978-151066500-2.

Conference paper

2023

Plasma-Based Intelligent Reflective Surfaces for Beam Steering Operations

M. Magarotto, L. Schenato, P. De Carlo, A.-D. Capobianco, "Plasma-Based Intelligent Reflective Surfaces for Beam Steering Operations", 17th European Conference on Antennas and Propagation (EuCAP), 189071, Florence, IT, 2023, ISBN 978-883129907-7

Conference paper

2022

Multiscale Modelling of Alternative Propellants in Helicon Plasma Thrusters

S. Andrews, R. Andriulli, N. Souhair, S. Di Fede, **M. Magarotto**, D. Pavarin, F. Ponti, “Multiscale Modelling of Alternative Propellants in Helicon Plasma Thrusters”, IAC-22-C4,6,9,x69515, 73rd International Astronautical Congress (IAC), Paris, FR, 2022, ISSN 0074-1795

Conference paper

2022

Feasibility Study on a plasma based reflective surface for SatCom systems

M. Magarotto, P. De Carlo, L. Schenato, F. Milza, D. Pavarin, A.-D. Capobianco, “Feasibility Study on a plasma based reflective surface for SatCom systems”, IAC-22-B2,6,2,x71767, 73rd International Astronautical Congress (IAC), Paris, FR, 2022, ISSN 0074-1795

Conference Paper

2022

Simulation of a magnetized plasma plume with a 3D fully kinetic PIC approach

S. Di Fede, **M. Magarotto**, D. Pavarin, "Simulation of a magnetized plasma plume with a 3D fully kinetic PIC approach", IEPC-2022-494, 37th International Electric Propulsion Conference (IEPC), Boston MA, USA, 2022

Conference paper

2022

Analysis of different numerical approaches for the simulation of a Helicon Plasma Thruster

N. Souhair, F. Ponti, **M. Magarotto**, D. Pavarin, "Analysis of different numerical approaches for the simulation of a Helicon Plasma Thruster", IEPC-2022-495, 37th International Electric Propulsion Conference (IEPC), Boston MA, USA, 2022

Conference paper

2022
Simulation and modelling of an iodine fed Helicon Plasma Thruster

N. Souhair, **M. Magarotto**, S. Dalle Fabbriche, R. Andrulli, S. Andrews, F. Ponti, D. Pavarin, "Simulation and modelling of an iodine fed Helicon Plasma Thruster", IEPC-2022-496, 37th International Electric Propulsion Conference (IEPC), Boston MA, USA, 2022

Conference paper

2022
3D Full PIC Simulation of a Magnetized Plasma Plume

S. Di Fede, **M. Magarotto**, D. Pavarin, "3D Full PIC Simulation of a Magnetized Plasma Plume", SP2022-161, 8th Space Propulsion conference, Estoril, PT, 2022

Conference paper

2022
Analysis of Different Numerical Approaches for the Simulation of a Helicon Plasma Thruster

N. Souhair, **M. Magarotto**, D. Pavarin, F. Ponti, "Analysis of Different Numerical Approaches for the Simulation of a Helicon Plasma Thruster", SP2022-190, 8th Space Propulsion conference, Estoril, PT, 2022

Conference paper

2021
Electric Propulsion for CubeSats: a Review

M. Magarotto, M. Manente, D. Pavarin, “Electric Propulsion for CubeSats: a Review”, IAC-21,C4,8-B4.5A,1,x64088, 72th International Astronautical Congress (IAC), Dubai, UAE, 2021, ISSN 0074-1795

Conference paper

2021
Numerical Suite for Magnetically Enhanced Plasma Thrusters

M. Magarotto, S. Di Fede, N. Souhair, S. Andrews, M. Manente, F. Ponti, D. Pavarin, “Numerical Suite for Magnetically Enhanced Plasma Thrusters”, IAC-21,C4,6,3,x64083, 72th International Astronautical Congress (IAC), Dubai, UAE, 2021, ISSN 0074-1795

Conference paper

2021
Advancements in Plasma Antennas for SatCom Navigation Systems

P. De Carlo, **M. Magarotto**, G. Mansutti, A.-D. Capobianco, D. Pavarin, “Advancements in Plasma Antennas for SatCom Navigation Systems”, IAC-21,B2,5,1,x64098, 72th International Astronautical Congress (IAC), Dubai, UAE, 2021, ISSN 0074-1795

Conference paper

2021
E-REGULUS: development of a 150 W prototype of magnetically enhanced plasma thruster

M. Duzzi, M. Manente, F. Trezzolani, N. Bellomo, A. Barbato, L. Cappellini, M. Minute, R. Mantellato, **M. Magarotto**, D. Paulon, A. Schiavon, D. Scalzi, A. Selmo, E. Toson, F. Milza, L. Bianchi, D. Di Cara, D. Pavarin, “E-REGULUS: development of a 150 W prototype of magnetically enhanced plasma thruster”, IAC-21,C4,5,9,x65151, 72th International Astronautical Congress (IAC), Dubai, UAE, 2021, ISSN 0074-1795

Conference paper

2021
A case study of a motorised flexible IOD platform: the UNISAT-7 and REGULUS mission

F. Milza, E. Toson, N. Bellomo, R. Di Roberto, N. Sparvieri, F. Graziani, F. Trezzolani, M. Manente, D. Paulon, A. Barbato, **M. Magarotto**, R. Mantellato, L. Cappellini, A. Selmo, M. Minute, M. Duzzi, D. Pavarin, “A case study of a motorised flexible IOD platform: the UNISAT-7 and REGULUS mission”, IAC-21,B4,6A,10,x65905, 72th International Astronautical Congress (IAC), Dubai, UAE, 2021, ISSN 0074-1795

Conference paper

2021
Improvement of a numerical tool for the simulation of a Helicon Plasma Thruster

N. Souhair, **M. Magarotto**, M. Manente, D. Pavarin, F. Ponti, "Improvement of a numerical tool for the simulation of a Helicon Plasma Thruster", SP2020_00070, 7th Space Propulsion Conference, SP2020+1, Virtual Conference, 2021

Conference paper

2021
REGULUS: integration and testing of an iodine electric propulsion system

N. Bellomo, **M. Magarotto**, M. Manente, F. Trezzolani, R. Mantellato, L. Cappellini, D. Paulon, A. Selmo, D. Scalzi, M. Minute, M. Duzzi, A. Barbato, A. Schiavon, N. Souhair, S. Di Fede, P. De Carlo, F. Barato, E. Toson, D. Pavarin, "REGULUS: integration and testing of an iodine electric propulsion system", SP2020_00109, 7th Space Propulsion Conference, SP2020+1, Virtual Conference, 2021

Conference paper

2021
Quasi 2D PIC model of a magnetically enhanced plasma thruster

M. Minute, **M. Magarotto**, A. Modesti, G. Moresco, F. Trezzolani, M. Manante, D. Pavarin, "Quasi 2D PIC model of a magnetically enhanced plasma thruster", SP2020_00110, 7th Space Propulsion Conference, SP2020+1, Virtual Conference, 2021

Coference paper

2021
Numerical Simulation of the Plume of a Magnetically Enhanced Plasma Thruster

S. Di Fede, **M. Magarotto**, S. Andrews, M. Manente D. Pavarin, "Numerical Simulation of the Plume of a Magnatically Enhanced Plasma Thruster", SP2020_00111, 7th Space Propulsion Conference, SP2020+1, Virtual Conference, 2021

Conference paper

2019
Enhancement of microsatellites' mission capabilities: integration of REGULUS electric propulsion module into UniSat-7

N. Bellomo, M. Manente, F. Trezzolani, A. Gloder, A. Selmo, R. Mantellato, E. Toson, L. Cappellini, M. Duzzi, D. Scalzi, A. Schiavon, A. Barbato, D. Paulon, N. Souhair, **M. Magarotto**, M. Minute, R. Di Roberto, D. Pavarin, F. Grazieni, "Enhancement of microsatellites' mission capabilities: integration of REGULUS electric propulsion module into UniSat-7", IAC-19,C4,8-B4.5A,5,x52699, 70th International Astronautical Congress (IAC), Washington, DC, USA, 2019, ISSN 0074-1795

Conference paper

2019
Curl Plasma Antenna for SatCom Navigation Systems

P. De Carlo, G. Mansutti, A.-D. Capobianco, D. Pavarin, C. Facchinetti, A. Tuozzi, **M. Magarotto**, "Curl Plasma Antenna for SatCom Navigation Systems", IAC-19,B2,1,3,x51735, 70th International Astronautical Congress (IAC), Washington, DC, USA, 2019, ISSN 0074-1795

Conference paper

2019
Inductive Plasma Thruster (IPT) design for an Atmosphere-Breathing Electric Propulsion System (ABEP)

F. Romano, G. Herdrich, P. C. E. Roberts, ..., **M. Magarotto**, D. Pavarin, "Inductive Plasma Thruster (IPT) design for an Atmosphere-Breathing Electric Propulsion System (ABEP)", IAC-19,C4,6,3,x49922, 70th International Astronautical Congress (IAC), Washington, DC, USA, 2019, ISSN 0074-1795

Conference paper

2019
Numerical Model of a Magnetically Enhanced Plasma Thruster

M. Magarotto, M. Manente, F. Trezzolani, D. Pavarin, "Numerical Model of a Magnetically Enhanced Plasma Thruster", IEPC-2019-415, 36th International Electric Propulsion Conference (IEPC), Vienna, A, 2019

Conference paper

2019
REGULUS: Iodine Fed Plasma Propulsion System for Small Satellites

M. Manente, F. Trezzolani, R. Mantellato, D. Scalzi, A. Schiavon, N. Souhair, M. Duzzi, L. Cappellini, A. Barbato, D. Paulon, A. Selmo, N. Bellomo, A. Gloder, E. Toson, M. Minute, **M. Magarotto**, D. Pavarin, "REGULUS: Iodine Fed Plasma Propulsion System for Small Satellites", IEPC-2019-417, 36th International Electric Propulsion Conference (IEPC), Vienna, A, 2019

Conference paper

2019
REGULUS: Know-How Acquired on Iodine Propellant

M. Manente, F. Trezzolani, R. Mantellato, D. Scalzi, A. Schiavon, L. Cappellini, F. Barato, N. Bellomo, A. Gloder, and E. Toson, M. Minute, D. Vallisari, **M. Magarotto**, D. Pavarin, "REGULUS: Know-How Acquired on Iodine Propellant", IEPC-2019-419, 36th International Electric Propulsion Conference (IEPC), Vienna, A, 2019

Conference paper

2019
Inductive plasma thruster (IPT) for an atmosphere breathing electric propulsion system: Design and set in operation

F. Romano, G. Herdrich, P. C. E. Roberts, ..., **M. Magarotto**, D. Pavarin, "Inductive plasma thruster (IPT) for an atmosphere breathing electric propulsion system: Design and set in operation", IEPC-2019-A-488, 36th International Electric Propulsion Conference (IEPC), Vienna, A, 2019

Conference paper

2019
Design and Numerical Characterization of a Realistic Plasma Dipole

P. De Carlo, G. Mansutti, **M. Magarotto**, A. D. Capobianco, D. Pavarin, A. Tuozzi, C. Facchinetti, "Design and Numerical Characterization of a Realistic Plasma Dipole", 21st International Conference on Electromagnetics in Advanced Applications (ICEAA), pp. 811-815, Granada, E, 2019, ISBN 978-1-72-810563-5

Conference paper

2018
Magnetic Enhanced Plasma Propulsion System for small-satellites IOD development

M. Manente, F. Trezzolani, N. Bellomo, **M. Magarotto**, E. Toson, R. Mantellato, F. Barato, D. Pavarin, "Magnetic Enhanced Plasma Propulsion System for small-satellites IOD development", IAC-18,C4,8-B4.5A,2,x45774, 69th International Astronautical Congress (IAC), Bremen, D, 2018, ISSN 0074-1795

Conference paper

2018
Analysis of electrodeless plasma source enhancement by an externally applied magnetic field for an inductive plasma thruster (IPT)

S. Masillo, F. Romano, ..., **M. Magarotto**, D. Pavarin, “Analysis of electrodeless plasma source enhancement by an externally applied magnetic field for an inductive plasma thruster (IPT)”, 7th Russian-German Conference on Electric Propulsion (RGCEP), 2018

Conference paper

2018
Numerical model of the Plasma Source of a Helicon Plasma Thruster

M. Magarotto, M. Manente, P. de Carlo, F. Trezzolani, D. Pavarin, D. Melazzi, "Numerical model of the Plasma Source of a Helicon Plasma Thruster", SP2018_00424, 6th Space Propulsion Conference, SP2018, Siville, E, 2018

Conference paper

2018
Development of a Miniature Plasma Propulsion Module for Small Satellites

F. Trezzolani, M. Manente, N. Bellomo, E. Toson, A. Selmo, **M. Magarotto**, P. De Carlo, D. Melazzi, D. Pavarin, "Development of a Miniature Plasma Propulsion Module for Small Satellites", SP2018_00432, 6th Space Propulsion Conference, SP2018, Siville, E, 2018

Conference paper

2017
Study on the Influence of the Magnetic Field Topology on the Power Deposition in a Helicon Plasma Source

M. Magarotto, M. Manente, P. de Carlo, F. Trezzolani, D. Pavarin, D. Melazzi, "Study on the Influence of the Magnetic Field Topology on the Power Deposition in a Helicon Plasma Source", IEPC-2017-58, 35th International Electric Propulsion Conference (IEPC), Atlanta GA, USA, 2017

Conference paper

2017
Development and test of a high power RF plasma thruster in project SAPERE-STRONG

F. Trezzolani, M. Manente, A. Selmo, D. Melazzi, **M. Magarotto**, D. Moretto, P. De Carlo, M. Pessana, D. Pavarin, "Development and test of a high power RF plasma thruster in project SAPERE-STRONG", IEPC-2017-462, 35th International Electric Propulsion Conference (IEPC), Atlanta GA, USA, 2017

Conference paper

2017
Development and testing of a miniature Helicon plasma thruster

F. Trezzolani, M. Manente, E. Toson, A. Selmo, **M. Magarotto**, D. Moretto, F. Bosi, P. De Carlo, D. Melazzi, D. Pavarin, "Development and testing of a miniature Helicon plasma thruster", IEPC-2017-519, 35th International Electric Propulsion Conference (IEPC), Atlanta GA, USA, 2017

Conference paper

2017
Numerical Study of Power Deposition, Transport and Acceleration Phenomena in Helicon Plasma Thrusters

M. Magarotto, M. Manente, P. de Calro, F. Trezzolani, D. Pavarin, D. Melazzi, "Numerical Study of Power Deposition, Transport and Acceleration Phenomena in Helicon Plasma Thrusters", IEPC-2017-565, 35th International Electric Propulsion Conference (IEPC), Atlanta GA, USA, 2017

Conference paper

2017
Numerical Model of an Helicon Plasma Source for Space Propulsion Application

M. Magarotto, F. J. Bosi, P. de Carlo, G. Gallina, M. Manente, F. Trezzolani, D. Pavarin, D. Melazzi, "Numerical Model of an Helicon Plasma Source for Space Propulsion Application", 7th European Conference for Aeronautics and Space Sciences, (EUCASS), Milan, IT, 2017

Conference paper

2017
Development of a counterbalanced pendulum thrust stand for electric propulsion

F. Trezzolani, **M. Magarotto**, M. Manente, D. Moretto, F. J. Bosi, G. Gallina, P. de Carlo, D. Melazzi, D. Pavarin, M. Pessana, "Development of a counterbalanced pendulum thrust stand for electric propulsion", 4th IEEE International Workshop on Metrology for AeroSpace (MetroAeroSpace), pp. 152-157., Padova, IT, 2017, ISBN 978-1-50-904234-0

Conference paper

2016
Numerical Investigation into the Power Deposition and Transport Phenomena in Helicon Plasma Sources

M. Magarotto, F. J. Bosi, P. de Carlo, M. Manente, F. Trezzolani, D. Pavarin, P. Alotto, D. Melazzi, “Numerical Investigation into the Power Deposition and Transport Phenomena in Helicon Plasma Sources”, COMSOL conference, Munich, DE, 2016

Conference paper

2016
Numerical simulation of Vibrationally Active Ar-H2 Microwave Plasma

F. Bosi, **M. Magarotto**, P. de Carlo, M. Manente, F. Trezzolani, D. Pavarin, D. Melazzi, P. Alotto, R. Bertani, “Numerical simulation of Vibrationally Active Ar-H2 Microwave Plasma”, COMSOL conference, Munich, DE, 2016

Conference paper

2019
Numerical and Experimental Investigation into the Performance of Plasma-Based Thruster for Space Propulsion

M. Magarotto, "Numerical and Experimental Investigation into the Performance of Plasma-Based Thruster for Space Propulsion", (2019)

PhD thesis

2015
Numerical Investigation into the Power Deposition and Transport Phenomena in Helicon Plasma Sources

M. Magarotto, "Numerical Investigation into the Power Deposition and Transport Phenomena in Helicon Plasma Sources", (2015)

Master thesis

2019
Investigation of Transient Regime Transition in Inductive Plasma Generators

R. Georg, A. Chadwick, B. Dally, G. Herdrich, F. Romano, **M. Magarotto**, D. Pavarin, "Investigation of Transient Regime Transition in Inductive Plasma Generators", IEPC-2019-287, 36th International Electric Propulsion Conference (IEPC), Vienna, A, 2019

Poster

2019
Quasi 2D PIC Model of a Magnetically Enhanced Plasma Thruster

M. Minute, **M. Magarotto**, I. Bevilacqua, F. Trezzolani, M. manente, D. Pavarin, "Quasi 2D PIC Model of a Magnetically Enhanced Plasma Thruster", IEPC-2019-416, 36th International Electric Propulsion Conference (IEPC), Vienna, A, 2019

Poster

2017
Numerical Study of Power Deposition, Transport and Acceleration Phenomena in Helicon Plasma Thrusters

M. Magarotto, M. Manente, P. De Carlo, F. Trezzolani, D. Pavarin, D. Melazzi, "Numerical Study of Power Deposition, Transport and Acceleration Phenomena in Helicon Plasma Thrusters", 35th International Electric Propulsion Conference (IEPC), Atlanta, GA, USA, 2017

Poster

2017
Testing and Characterization of Counterbalanced Pendulum Thrust Stand for Electric Propulsion

F. Trezzolani, **M. Magarotto**, M. Manente, D. Moretto, P. De Carlo, D. Melazzi, M. Pessana, D. Pavarin, "Numerical Study of Power Deposition, Testing and Characterization of Counterbalanced Pendulum Thrust Stand for Electric Propulsion", 35th International Electric Propulsion Conference (IEPC), Atlanta GA, USA, 2017

Poster

TEACHING

05/2023 – CURRENT
Antennas and wireless propagation - University of Padova

“Antennas and wireless propagation” for the Master's degree in Electronic Engineering – 48 hours, CFU 6

2022-23 **CFU 3** - hours 24
Satisfaction 8.92 - Teaching 9.08 - Organization 9.07
2023-24 **CFU 3** - hours 24
Satisfaction 8.89 - Teaching 8.67 - Organization 9.34

05/2023 – CURRENT
Propagazione guidata e dispositivi - University of Padova

“Propagazione guidata e dispositivi” for the Bachelor's degree in Electronic Engineering – 48 hours, CFU 6

2022-23 **CFU 3** - hours 24
Satisfaction 8.04 - Teaching 8.11 - Organization 8.32
2023-24 **CFU 3** - hours 24
Satisfaction 8.46 - Teaching 8.59 - Organization 8.80

09/2022 – 12/2022
Microwave Devices - University of Padova

Teaching support activity for the class of “Microwave Devices”, Master's degree in Electronic Engineering – 12 hours

2022-23 hours 12, Prof. Andrea Galtarossa

09/2018 – 06/2021
Laboratorio di Propulsione Aerospaziale - University of Padova

Teaching support activity for the class of “Laboratorio di Propulsione Aerospaziale”, Master's degree in Aerospace Engineering – 30 hours

2017-18 hours 10, Prof. Daniele Pavarin
2018-19 hours 10, Prof. Daniele Pavarin
2020-21 hours 10, Prof. Daniele Pavarin

09/2016 – 12/2021

Aerospace Structures 2 - University of Padova

Teaching support activity for the class of “Aerospace Structures 2”, Master's degree in Aerospace Engineering – 84 hours

2016-17 hours 16, Prof. Ugo Galvanetto
2017-18 hours 16, Prof. Ugo Galvanetto
2018-19 hours 16, Prof. Ugo Galvanetto
2020-21 hours 16, Prof. Ugo Galvanetto
2021-22 hours 20, Prof. Mirco Zaccariotto

09/2015 – 06/2022

Costruzioni e Strutture Aerospaziali 1 - University of Padova

Teaching support activity for the class of “Costruzioni e Strutture Aerospaziali 1”, Bachelor's degree in Aerospace Engineering – 151 hours

2015-16 hours 25, Prof. Ugo Galvanetto
2016-17 hours 24, Prof. Ugo Galvanetto
2017-18 hours 24, Prof. Ugo Galvanetto
2018-19 hours 24, Prof. Ugo Galvanetto
2020-21 hours 24, Prof. Ugo Galvanetto
2021-22 hours 30, Prof. Ugo Galvanetto

STUDENTS SUPERVISOR

Supervision Bachelor's Degree thesis

- R. Alberti "Superfici al plasma riconfigurabili" (2024), Electronic Engineering, University of Padova, Padova, IT.
- S. Ferracane "Antenne a radiofrequenza e la loro applicazione nelle sorgenti al plasma per propulsione spaziale" (2024), Electronic Engineering, University of Padova, Padova, IT.
- A. Marchetti "Antenne al plasma: stato dell'arte e principali applicazioni" (2024), Electronic Engineering, University of Padova, Padova, IT.
- F. Tempo "Superfici Riflettenti intelligenti (IRS) basate su tecnologia di plasma" (2024), Electronic Engineering, University of Padova, Padova, IT.
- F. Filippin "Superfici Riflettenti intelligenti" (2024), Electronic Engineering, University of Padova, Padova, IT.

Co-supervision PhD programme

- F. Cescon, "Development of a multiscale numerical model for the analysis of Helicon Plasma Thrusters", University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin. Duration: 2024-ongoing
- S. Di Fede, "Optimization of the magnetic nozzle of a 50 W helicon plasma thruster", University of Padova, Padova, Italy. Supervisor: Prof. D. Pavarin. Duration: 2019-2023
- N. Souhair, "Development of a Numerical Tool for the Simulation, Design and Optimization of a Helicon Plasma Thruster", University of Bologna, Forlì, Italy. Supervisor: Prof. F. Ponti. Duration: 2019-2023

Tutor Borsa di Ricerca

Tutor Borsa di Ricerca, S. Andrews "Code Development for Plasma Source Simulations and Numerical Study on Plasma Antennas" (2020), in the frame of the project "Plasma Antenna Technologies – PATH" G.A. 734629 (2020-MSCA-RISE-2016/H2020-MSCA-RISE-2016). Supervisor: Prof. Daniele Pavarin

2024

Co-supervision Master's Degree thesis

- D. Marotti "Preliminary design of a RF cathode for an Iodine based neutralizer" (2024), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. M. Magarotto
- L. Tonon "Prliminary design of a fluidic line for an iodine-fed RF cathode" (2024), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. M. Magarotto
- V. Savegnago "Prliminary design of an iodine fluidic line" (2024), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Dr. Marco Manente; Co-supervisor: Dr. M. Magarotto

2022
Co-supervision Master's Degree thesis

- M. P. Tangaro "Experimental characterization of a fluidic line for the realization of plasma gas mixtures" (2022), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Cosupervisor: Dr. P. De Carlo and Dr. M. Magarotto

2021
Co-supervision Master's Degree thesis

- G. Dalla Volpe "Optimization of a Cathode-less plasma thruster" (2021), Aerospace Engineering, Polytechnic University of Torino, Torino, IT. Supervisor: Prof. L. Casalino; Co-supervisor: Dr. M. Magarotto
- N. Magro "Performance enhancing strategies for small helicon plasma thrusters" (2021), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavrin; Co-supervisor: Dr. M. Magarotto
- R. Premuni "Thermal balance of neutral gas in a helicon plasma thruster" (2021), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. M. Magarotto
- M. Guaita "Semi-Analytical Mono-Dimensional Modelling of Cathodeless Plasma Thrusters" (2021), Aerospace Engineering, Polytechnic University of Milano, Milano, IT. Supervisor: Prof. M. Lavagna; Cosupervisor: Dr. M. Magarotto, Dr. M. Manente
- C. Isone "Ottimizzazione di un motore elettrico attraverso la simulazione del plasma nella regione di sorgente" (2021), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Cosupervisor: Dr. M. Magarotto

2020
Co-supervision Master's Degree thesis

- J. Giacomelli "Experimental characterization and optimization of plasma sources for a Gaseous Plasma Antenna (GPA)" (2020), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. P. De Carlo and Dr. M. Magarotto
- J. Bellini "Ottimizzazione numerica di un Helicon Plasma Thruster di media potenza" (2020), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. M. Magarotto
- A. Modesti "Numerical optimization of a Quasi-2D Particle-In-Cell code for preliminary design of RF Plasma Thrusters" (2020), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisors: Dr. M. Magarotto, Dr. M. Manente, Dr. M. Minute
- D. Vallisari "Indagine Numerica del Meccanismo di Accelerazione del Plasma in un Propulsore Helicon al Plasma" (2020), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. M. Magarotto

2019
Co-supervision Master's Degree thesis

- I. Bevilacqua "Numerical and experimental optimization of the magnetic configuration of a RF plasma thruster" (2019), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. M. Minute and Dr. M. Magarotto

2018
Co-supervision Master's Degree thesis

- A. Colovini "Optimization of the magnetic configuration of STRONG RF thruster" (2018), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. F. Trezzolani and Dr. M. Magarotto
- M. Minute "Preliminary Design of a Iodine Fed-System for a Magnetically Enhanced Thruster" (2018), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. F. Trezzolani and Dr. M. Magarotto
- D. Scalzi "Preliminary Thermo-Structural Design of a Cathodeless RF Thruster" (2018), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. F. Trezzolani and Dr. M. Magarotto

2016
Co-supervision Master's Degree thesis

- D. Moretto "Development and Testing of a Thrust Measurement System for Plasma Thrusters Characterization and Optimization" (2016), Aerospace Engineering, University of Padova, Padova, IT. Supervisor: Prof. D. Pavarin; Co-supervisor: Dr. F. Trezzolani and Dr. M. Magarotto

PROJECTS

2023 – CURRENT
FLAIRS (eFficient pLasmA Intelligent Reflecting Surface)

Funding body: Ministero dell'Università e della Ricerca (PRIN - PNRR 2022), P2022RFF9K
Budjet: € 239,997.00

Scope:
The FLAIRS project focuses on developing and exploring the innovative technology of plasma-based Intelligent Reflecting Surfaces (IRSs). A proof of concept for this technology will be realized and tested. Simultaneously, technological enhancements will be made to optimize plasma sources for telecommunications applications. The target Technology Readiness Level (TRL) for plasma-based IRSs is 4, with expectations to advance plasma sources to TRL 6.

Contribution:
Design of **plasma-based IRS** and plasma sources.

2023 – CURRENT
BOOST (Building blOcks for iOdine thruSTer)

Funding body: European Commission (HORIZON-CL4-2023-SPACE-01-12), GAP-101135216
Budjet: € 2,174,735.00

Scope:
Solid iodine propellant has emerged as a key technology to advance electric propulsion (EP) in the SmallSat market. To pave the way for future standardization and industrialization of iodine-based EP, the BOOST project will adopt a modular approach. Various EP building blocks, tailored for different thruster types such as Grid Ion Thrusters (GIT) and Hall Effect Thrusters (HET), will be developed and integrated, aiming to reach Technology Readiness Level (TRL) 5/6.

Contribution:
Design of a neutralizer based on the Radio Frequency (RF) cathode technology and compatible with iodine propellant, **electromagnetic simulations** of the RF system.

2023 – CURRENT
RESTART (RESearch and innovation on future Telecommunications systems and networks to make Italy more smART)

Funding body: European Union under the Italian National Recovery and Resilience Plan (NRRP) of NextGenerationEU

Scope:
RESTART drives the advancement of telecommunications science and technology, encompassing a wide range of systems and networks for both human and non-human users (e.g., 5G/6G, high-capacity fixed infrastructures, IoT, edge and core cloud). It supports applications and services across diverse sectors, including agriculture, commerce, energy, finance, industry, media, health, security, and transportation.

Contribution:
Development and optimization of **plasma-based Intelligent Reflecting Surfaces (IRS)** and smart antennas.

2021 – 2022
IRIS (hIgh peRformance computIng plaSma)

Funding body: PRACE (Partnership for Advanced Computing in Europe)

Scope:
To optimize and customize electric plasma thrusters, precise numerical simulations are essential. The adopted approach is the particle-in-cell (PIC) method, where particle trajectories are integrated using a Lagrangian approach, and the resulting electromagnetic fields are solved on a grid. The project aims to accelerate the PIC software used for simulating plasma thrusters (specifically, the open-source Java code SPIS) to make it compatible with High Performance Computing (HPC) systems.

Contribution:
Supervision of the code development, physical analysis.

2019 – 2022
PlasMix4Space (Plasma Basato su Miscele di Gas per lo Spazio e le Telecomunicazioni)

Funding body: University of Padova
Budjet: € 100,354.00

Scope:
The project focuses on enhancing the efficiency of plasma sources used in space propulsion and telecommunications through the use of gas mixtures. A dedicated fluidic system has been developed for gas mixing. Prototypes of plasma antennas and electric space thrusters have been designed, built, and tested.

Contribution:
Development and testing of the fluidic system for gas mixing. Test **plasma antennas** and plasma thruster prototypes. Select appropriate gas mixtures.

2019 – 2022
E-REGULUS

Funding body: European Space Agency (ESA)

Scope:
Initially developed for educational missions, first-generation CubeSats and MicroSats have matured significantly. To unlock their full potential, these platforms need enhanced mobility. The E-REGULUS project addresses this need with a cutting-edge, electrodeless, cathodeless, multi-propellant, radiofrequency-based thruster, specifically designed for the next generation of platforms. The target thrust is 1.5 mN with an operational power of 150 W.

Contribution:
Desin of the thruster via numerical simulations of the **electromagnetic wave propagation** and the plasma dynamics.

2017 – 2020
EPT.COM (Antenne al Plasma – Tecnologia abilitante per SATCOM)

Funding body: Italian Space Agency (ASI)
Budjet: € 478,724.00

Scope:
The EPT.COM (Enabling Plasma Technology for Satellite Communications) project aims to conduct fundamental research to enhance plasma technology, with the goal of designing and developing a new generation of spaceborne antennas. The objective is to overcome the limitations of current plasma source technologies. The project has analyzed two distinct plasma antenna concepts: an active plasma dipole and a transmit-array.

Contribution:
Development, simulation, and tests of **plasma antennas** and plasma sources.

2017 – 2021
REGULUS

Funding Body: Technology for Propulsion and Innovation S.p.A.

Scope:
The project focuses on developing an electric thruster specifically for CubeSats, aiming to achieve a performance of 0.6 mN with an input power of 60 W. The thruster uses solid iodine as propellant and was successfully demonstrated in orbit in March 2021.

Contribution:
Desin of the thruster via numerical simulations of the **electromagnetic wave propagation** and the plasma dynamics.

2016 – 2022
PATH (Plasma Antenna TecHnologies)

Funding body: European Commission (H2020-MSCA-RISE-2016), GAP-734629
Budjet: € 792,000.00

Scope:
The project is intended to promote a collaborative researches focused in the development of high density plasma sources implemented with the exchange of staff personnel between the partners of the network. The research will also address transfer of knowledge and training of the researchers in the specific field of plasma sources and its applications in the telecommunication sector.

Contribution:
Development, simulation, and tests of **plasma antennas** and plasma sources.

2013 – 2017
SAPERE (Space Advanced Project for Excellence in Research and Enterprise)

Funding body: Ministero dell'Università e della Ricerca (PON Ricerca e Innovazione)

Scope:
The SAPERE project is divided into two sub-projects: STRONG (Sistemi Tecnologie e Ricerche per l'Operatività Nazionale Globale) and SAFE (Space Assets for Emergency). The goal of STRONG is to develop a Space Tug powered by electric plasma thrusters.

Contribution:
Design of the electric plasma thruster via numerical simulations of the **electromagnetic wave propagation** and plasma dynamics.

FINANCED PROJECTS

PASCHEN (Plasma Antennas for SatCom and super High-frequency ENabling)

Kick-off meeting planned 2024
Funding body: Italian Space Acency (ASI)
Budjet: € 516,933.00

Scope:
The PASCHEN project aims to bridge the technological gaps that limit the application of plasma antennas in the current operational scenarios, particularly in the space sector. To this end, an array of plasma antennas capable of operating in the C-band or X-band (4-12 GHz) and performing controlled beam steering will be designed, developed, and tested. The target TRL (Technology Readiness Level) for the array demonstrator is 4/5. Finally, a feasibility study for the spatialization of the prototype will be produced, thus providing an evolution plan for the development of plasma antennas for space systems up to a TRL of 8/9.

Expected contribution:

Design of **plasma antenna array** and plasma sources.

LANDAU (pLasma ANtennas aDvanced mAnUfacturing)

Kick-off meeting planned 2024
Funding body: Italian Space Acency (ASI)
Budjet: € 293,795.00

Scope:
The LANDAU project aims to develop a plasma antenna using optimized plasma sources. This will be achieved through the careful selection of materials and the application of advanced manufacturing techniques to meet specific performance criteria. Surface coatings will be applied to tailor material properties, maximizing the efficiency of the plasma sources. Additionally, additive manufacturing will enable the creation of non-standard geometries beyond those available in the market. The optimized sources will be integrated into a plasma antenna prototype for space applications, targeting a Technology Readiness Level (TRL) of 5/6.

Expected contribution:
Design of **plasma antenna** and plasma sources.

EDITORIAL BOARD

09/2022 – 09/2023
Numeric Simulations in Electric Propulsion

Special issue "Numerical Simulations in Electric Propulsion", Aerospace.
Guest editors: Dr. Nabil Souhair, Prof. F. Ponti, **Dr. M. Magarotto**, Dr. V. Giannetti.

INTERNATIONAL COLLABORATIONS

Center of Studies and Activities for Space (CISAS) "Giuseppe Colombo" - University of Padova, Padova, Italy

- PhD degree 2015-2019
- Assegno di ricerca 2018-2020
- Borsa di ricerca 2021

Department of Industrial Engineering (DII) - University of Padova, Padova, IT

- Assegno di ricerca 2020-2021
- Assegno di ricerca 2022

Department of Industrial Engineering - University of Bologna, Forlì, IT

Collaboration in the frame of numerical codes to simulate the plasma dynamics and **electromagnetic wave propagation** in electric plasma thrusters

- "Cathode-less RF plasma thruster design and optimisation for an atmosphere-breathing electric propulsion (ABEP) system", Acta Astronautica 255 (2024): 833-844
- "Predicting the antenna properties of helicon plasma thrusters using machine learning techniques", Journal of Electric Propulsion 3.1 (2024): 6
- "Fully kinetic study of facility pressure effects on RF-source magnetic nozzles", Acta Astronautica 215 (2024): 362-372
- "Development of a Global Model for the Analysis of Plasma in an Atmosphere-Breathing Cathode-Less Thruster", Aerospace 10.5 (2023): 389
- "Coupled global and PIC modelling of the REGULUS cathode-less plasma thrusters operating on xenon, iodine and krypton", Acta Astronautica 207 (2023): 227-239
- "Prediction of the Propulsive Performance of an Atmosphere-Breathing Electric Propulsion System on Cathode-Less Plasma Thruster", Aerospace 10.2 (2023): 100
- "Different fluid strategies for the simulation of a Helicon Plasma Thruster", Contributions to Plasma Physics 63.2 (2023): e202200128
- "Numerical suite for cathodeless plasma thrusters", Acta Astronautica 197 (2022): 126-138
- “Analysis of the plasma transport in numerical simulations of helicon plasma thrusters”, AIP Advances 11.11 (2021): 115016
- “Development of a lumping methodology for the analysis of the excited states in plasma discharges operated with argon, neon, krypton, and xenon”, Physics of Plasmas 28.9 (2021): 093504

ELEDIA Research Center - University of Trento, Trento, IT

Collaboration in the frame of **plasma antennas**

- "Design of a Hybrid Metal-Plasma Transmit-Array with Beam-Scanning Capabilities", IEEE Transactions on Plasma Science 50.3 (2022): 662-669
- "Modeling and design of a plasma-based transmit-array with beam scanning capabilities." Results in Physics 16 (2020): 102923

Department of Information Engineering - University of Brescia, Brescia, IT

Collaboration in the frame of **plasma antennas** and **VO2 technology for telecommunications**.

- "A reflective metalens with tunable focal length for millimeter waves", IEEE Access 11 (2023): 104191-104199
- "Plasma Antennas: A Comprehensive Review", IEEE Access 12 (2024): 80468-80490

Wellman Center for Photomedicine - Harvard Medical School, Boston MA, USA

Collaboration in the frame of **plasma antennas**

- "Design of a Hybrid Metal-Plasma Transmit-Array with Beam-Scanning Capabilities", IEEE Transactions on Plasma Science 50.3 (2022): 662-669

Department of Electrical & Computer Engineers - Aristotle University of Thessaloniki, Thessaloniki, GR

Collaboration in the frame of **plasma antennas**

- “Characterisation of a thermionic plasma source apparatus for high-density gaseous plasma antenna applications”, Plasma Sources Science and Technology 29.11 (2020): 115002

Tony Davies High Voltage Laboratory - University of Southampton, Southampton, UK

Collaboration in the frame of **plasma antennas**

- “Characterisation of a thermionic plasma source apparatus for high-density gaseous plasma antenna applications”, Plasma Sources Science and Technology 29.11 (2020): 115002

School of Communication and Information Engineering - Shanghai University, Shanghai, CN

Collaboration in the frame of **plasma antennas**

- "Numerical Suite for Gaseous Plasma Antennas Simulation", IEEE Transactions on Plasma Science 49.1 (2021): 285-297

Aerospace Research Institute (ARI) - Ministry of Science Research and Technology, Teheran, IR

Collaboration in the frame of **plasma antennas**

- "Plasma Antennas: A Comprehensive Review", IEEE Access 12 (2024): 80468-80490

College of Engineering and Architecture - International University of Rabat, Salé, MA

Collaboration in the frame of numerical codes to simulate the plasma dynamics and **electromagnetic wave propagation** in electric plasma thrusters

- "Cathode-less RF plasma thruster design and optimisation for an atmosphere-breathing electric propulsion (ABEP) system", Acta Astronautica 255 (2024): 833-844
- "Predicting the antenna properties of helicon plasma thrusters using machine learning techniques", Journal of Electric Propulsion 3.1 (2024): 6
- "Fully kinetic study of facility pressure effects on RF-source magnetic nozzles", Acta Astronautica 215 (2024): 362-372

School of Mechanical & Aerospace Engineering - Nanyang Technological University, Singapore, SG

Collaboration in the frame of numerical codes to simulate the plasma dynamics and **electromagnetic wave propagation** in electric plasma thrusters

- "Magnetic nozzle performance in a cluster of helicon plasma thrusters", Plasma Sources Science and Technology 32.6 (2023): 065013

Depertment of Chemical Sciences - University of Padova, Padova, IT

Collaboration in the frame of plasma-based reactors for water treatment

- "Products, reactive species and mechanisms of PFOA degradation in a self-pulsing discharge (SPD) plasma reactor", Chemosphere 341 (2023): 139972
- "Comparative performance assessment of plasma reactors for the treatment of PFOA; reactor design, kinetics, mineralization and energy yield." Chemical Engineering Journal 382 (2020): 123031

Department of Aerospace Science and Technology - Politecnico di Milano, Milan, IT

Collaboration in the frame of numerical codes to simulate the performance of electric plasma thrusters

- “Semi-analytical Model of a Helicon Plasma Thruster”, IEEE Transactions on Plasma Science 50.2 (2022): 425-438

Institute of Space Systems (IRS) - University of Stuttgart, Pfaffenwaldring, DE

Collaboration in the frame of electromagnetic codes to simulate the **electromagnetic wave propagation** in electric plasma thrusters

- “Inductive Plasma Thruster (IPT) design for an Atmosphere-Breathing Electric Propulsion System (ABEP)”, IAC-19,C4,6,3,x49922, 70th International Astronautical Congress (IAC), Washington, DC, USA, 2019

HONOURS AND AWARDS

04/2022
Outstanding Reviewer Award 2021 – IOP Publishing

Outstanding Reviewer for "Journal of Physics D: Applied Physics" in 2021

CONFERENCES AND SEMINARS

23/06/2024 – 28/06/2024 Toulouse (FR)
38th International Electric Propulsion Conference (IEPC)

Session chair

- "Metamaterials for Electric Propulsion", IEPC-2024-134, **Presenting Author**
- "Self-consistent Coupling of Fluid and PIC Codes", IEPC-2024-130
- "Advancing Iodine Thruster Technology: Insights and Objectives of Project BOOST", IEPC-2024-310
- "Cluster of Magnetic Nozzles: A Fully Kinetic 3D PIC Simulation Study", IEPC-2024-415
- "A Self-Consistent Drift-Dissipative Instability Model of Anomalous Transport in the Magnetic Nozzle", IEPC-2024-810

17/03/2024 – 22/03/2024 Glasgow, UK
18th European Conference on Antennas and Propagation (EuCAP)

- "Recent Advances in Plasma Surfaces", 1570962694, **Presenting author**
- "Tunable Rectangular Waveguide Bandpass Filter Based on Plasma Technology", 1570965070

02/10/2023 – 08/10/2023 Baku, AZ
74th International Astronautical Congress (IAC)

Keynote speech

- **Keynote**: "X-band Plasma-Based Reflective Surface", IAC-23-B2.6.1-x76494, **Presenting author**
- Novel Coupling Methods for Fluid and Kinetic Solvers in the numerical modeling of Helicon Plasma Thrusters", IAC-23-C4.6.5-x77868
- Modelling and design of Earth and Mars atmosphere-breathing electric propulsion systems (ABEP) using a cathode-less RF thruster", IAC-23,C4,5,10,x77484, **Presenting author**
- "Atmosphere-Breathing Electric Propulsion (ABEP) System using a Cathode-Less RF Plasma Thruster: Design and Robust Optimisation for VLEO", IAC-23,C4,9,3,x77511, **Presenting Author**

26/03/2023 – 31/03/2023 Florence, IT
17th European Conference on Antennas and Propagation (EuCAP)

- "Plasma-Based Intelligent Reflective Surfaces for Beam Steering Operations", **Presenting author**

19/06/2022 – 23/06/2022 Boston MA, USA
37th International Electric Propulsion Conference (IEPC)

Session chair

- "Simulation of a magnetized plasma plume with a 3D fully kinetic PIC approach", IEPC-2022-494, **Presenting author**
- "Analysis of different numerical approaches for the simulation of a Helicon Plasma Thruster", IEPC-2022-495
- "Simulation and modelling of an iodine fed Helicon Plasma Thruster", IEPC-2022-496

24/10/2021 – 28/10/2021 Dubai, UAE
72nd International Astronautical Congress (IAC)

Keynote speech

- **Keynote**: "Electric Propulsion for CubeSats: a Review", IAC-21,C4,8-B4.5A,1,x64088, **Presenting author**
- "Numerical Suite for Magnetically Enhanced Plasma Thrusters", IAC-21,C4,6,3,x64083
- "Advancements in Plasma Antennas for SatCom Navigation Systems", IAC-21,B2,5,1,x64098, **Presenting author**
- "E-REGULUS: development of a 150 W prototype of magnetically enhanced plasma thruster", IAC-21,C4,5,9,x65151, **Presenting author**
- "A case study of a motorised flexible IOD platform: the UNISAT-7 and REGULUS mission", IAC-21,B4,6A,10,x65905, **Presenting author**

05/2021 – 07/2021 On-line event
Summer student contest in the frame of the 37th International Electric Propulsion Conference (IEPC)

Organizer

16/03/2021 – 18/03/2021 On-line conference
7th Space Propulsion Conference

- "Improvement of a numerical tool for the simulation of a Helicon Plasma Thruster", SP2020_00070
- "REGULUS: integration and testing of an iodine electric propulsion system", SP2020_00109, **Presenting author**
- "Quasi 2D PIC model of a magnetically enhanced plasma thruster", SP2020_00110
- "Numerical Simulation of the Plume of a Magnetically Enhanced Plasma Thruster", SP2020_00111

14/09/2019 – 19/09/2019 Vienna, A
36th International Electric Propulsion Conference (IEPC)

Session chair

- "Numerical Model of a Magnetically Enhanced Plasma Thruster", IEPC-2019-415, **Presenting author**
- "REGULUS: Iodine Fed Plasma Propulsion System for Small Satellites", IEPC-2019-417, **Presenting author**
- "REGULUS: Know-How Acquired on Iodine Propellant", IEPC-2019-419, **Presenting author**
- "Inductive plasma thruster (IPT) for an atmosphere breathing electric propulsion system: Design and set in operation", IEPC-2019-A-488

13/05/2018 – 17/05/2018 Seville, E
6th Space Propulsion Conference

- "Numerical model of the Plasma Source of a Helicon Plasma Thruster", SP2018_00424, **Presenting author**
- "Development of a Miniature Plasma Propulsion Module for Small Satellites", SP2018_00432, **Presenting author**

07/10/2017 – 11/10/2017 Atlanta GA, USA
35th International Electric Propulsion Conference (IEPC)

- "Study on the Influence of the Magnetic Field Topology on the Power Deposition in a Helicon Plasma Source", IEPC-2017-58, **Presenting author**
- "Development and test of a high power RF plasma thruster in project SAPERE-STRONG", IEPC-2017-462, **Presenting author**
- "Development and testing of a miniature Helicon plasma thruster", IEPC-2017-519, **Presenting author**
- "Transport and Acceleration Phenomena in Helicon Plasma Thrusters", IEPC-2017-565, **Presenting author**

02/07/2017 – 05/07/2017 Milan, IT
7th European Conference for Aeronautics and Space Science (EUCASS)

- "Numerical Model of an Helicon Plasma Source for Space Propulsion Application", **Presenting author**

20/06/2017 – 22/06/2017 Padova, IT
4th IEEE International Workshop on Metrology foe Aerospace

- "Development of a counterbalanced pendulum thrust stand for electric propulsion", **Presenting author**

11/10/2016 – 13/10/2016 Munich, DE
COMSOL conference

- "Numerical Investigation into the Power Deposition and Transport Phenomena in Helicon Plasma Sources", **Presenting author**
- "Numerical simulation of Vibrationally Active Ar-H2 Microwave Plasma", **Presenting author**

INVITED TALKS

06/10/2023
Keynote: X-band Plasma-Based Reflective Surface

M. Magarotto, L. Schenato, N. Souhair, F. Ponti, F. Milza, P. De Carlo, D. Pavarin, M. Santagiustina, A.-D. Capobianco, "KEYNOTE: X-band Plasma-Based Reflective Surface", IAC-23-B2.6.1-x76494, 74th International Astronautical Congress (IAC), Baku, AZ, 2023

12/12/2022
Electric propulsion systems for CubeSats

Seminar for the Master's degree in Aerospace Engineering, University of Bologna, Forlì, IT

24/05/2022
EMI effects generated by electric propulsion on spacecraft

2022 ESA Workshop on Aerospace EMC, 23-25 May 2022, on-line event

11/12/2021
Electric propulsion systems for CubeSats

Seminar for the Master's degree in Aerospace Engineering, University of Bologna, Forlì, IT

27/10/2021
Keynote: Electric Propulsion for CubeSats: a Review

M. Magarotto, M. Manente, D. Pavarin, “Electric Propulsion for CubeSats: a Review”, IAC-21,C4,8-B4.5A,1,x64088, 72th International Astronautical Congress (IAC), Dubai, UAE, 2021

10/01/2021
Space electric propulsion

Seminar for the PhD course in Sciences, Technologies and Measurements for Space, University of Padova, Padova, IT

ORGANIZATION

05/2021 – 07/2021
37th International Electric Propulsion Conference (IEPC)

Member of the organization board of the "summer student contest" in the frame of the 37th International Electric Propulsion Conference (IEPC).

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Excellent knowledge of the Matlab language | Excellent knowledge of the COMSOL software | Excellent knowledge of the OpenFOAM library | Good knowledge of C and C++ languages | Good knowledge of SPIS software | Intermediate knowledge of Fortran language | Good knowledge of the Office Package | Excellent knowledge of LaTeX | Excellent knowledge of the CST Studio Suite software

RECOMMENDATIONS

Andrea Galtarossa Professor of Electromagnetic Fields, University of Padova

RTDa co-supervisor

Email [redacted]

Antonio-Daniele Capobianco Associate Professor of Electromagnetic Fields, University of Padova

RTDa supervisor

Email [redacted]

Daniele Pavarin Associate Professor of Space Propulsion, University of Padova

Master's degree thesis supervisor
PhD thesis supervisor
Post-doctoral fellowships supervisor

Email [redacted]

DRIVING LICENCE

Driving Licence: A

Driving Licence: B