

Carlos Paz-Soldan

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Professional Positions

Associate Professor	2021–present
Applied Physics and Applied Math Department	Columbia University, New York NY
Staff Scientist	2014–2020
Post-doctoral Fellow	2012–2014
DIII-D National Fusion Facility	General Atomics, San Diego CA

Education

Ph.D. , Physics	University of Wisconsin-Madison, 2007–2012
M.Sc. , Engineering Physics	University of Wisconsin-Madison, 2007–2009
B.Sc.E. , Engineering Physics	Queen's University at Kingston, 2003–2007

Research Leadership

Principal Investigator, Columbia [Plasma Stability, Disruptions, & Control Research](#) 2021–present
Lead a research team of over a dozen scientists and graduate students as well as dozens of undergraduates conducting research in these areas in support of the public and private fusion program

Co-Leader, Negative Triangularity Working Group at DIII-D National Fusion Facility 2019–2023
Organize research program towards the development of negative triangularity reactor scenarios

Co-Leader, ELM Control Research Area at DIII-D National Fusion Facility 2016–2023

Principal Investigator, Genaral Atomics Internal R&D Project: DIII-D New Capabilities 2020
Identify capability upgrade opportunities and develop physics and engineering assessments.

Principal Investigator, GA Internal R&D Project: Non-Planar Superconducting Coils 2019–2020
Develop advanced winding and fabrication techniques to mitigate strain in HTS tape conductor

Leader, MHD+Macro Topical Group, US Burning Plasma Organization 2018–2022

Member, International Tokamak Physics Activity (ITPA) Pedestal and Edge Physics 2017–present

Expert, International Tokamak Physics Activity (ITPA) MHD, Disruptions, Control 2015–present

Service

Member, Fusion Energy Sciences Advisory Committee (FESAC), <i>US DOE</i>	2022–present
Chair, FESAC Decadal Plan Sub-Committee, <i>US DOE</i>	2024–present
President, University Fusion Association	2025–present
Vice-Chair, FESAC Facilities Construction Projects Sub-Committee, <i>US DOE</i>	2023–2024
Co-Chair, Workforce Accelerator for Fusion Energy Technology Development	2023–2024
Chair, User Board, DIII-D National Fusion Facility	2024–present
Division of Plasma Physics Meeting Program Committee, <i>American Physical Society</i>	2018, 2022
Award Committees (Stix, Rosenbluth, Fellow), <i>American Physical Society</i>	2013, 2021, 2022, 2025

Professional Honors

Fellow, <i>American Physical Society</i>	2024
Thomas Stix Award for Early Career Contrib. to Plasma Physics , <i>American Physical Society</i>	2021
Marshall Rosenbluth Outstanding Doctoral Thesis Award , <i>American Physical Society</i>	2013
Doctoral Fellowship, <i>National Science and Engineering Research Council (NSERC)</i>	2009–2012

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Selected Publications (Reverse Chronological Order)

- C. Paz-Soldan** et al, *Simultaneous access to high normalized density, current, pressure, and confinement in strongly-shaped diverted negative triangularity plasmas*, [Nucl. Fusion 64 094002 \(2024\)](#)
- A.O. Nelson, L. Schmitz, **C. Paz-Soldan**, et al, *Robust Avoidance of Edge-Localized Modes alongside Gradient Formation in the Negative Triangularity Edge*, [Phys. Rev. Lett. 131 195101 \(2023\)](#)
- C. Paz-Soldan**, C. Reux, et al, *A novel path to runaway electron mitigation via deuterium injection and current-driven MHD instability*, [Nucl. Fusion 61 116058 \(2021\)](#)
- C. Paz-Soldan** *Plasma Performance and Operational Boundaries without ELMs in DIII-D*, [Plasma Phys. Control. Fusion 63 083001 \(2021\)](#) Topical Review
- C. Reux, **C. Paz-Soldan**, et al, *Demonstration of Safe Termination of Mega-Ampere Relativistic Electron Beams in Tokamaks*, [Phys. Rev. Lett. 126 175001 \(2021\)](#)
- D. Weisberg, **C. Paz-Soldan**, et al, *Passive deconfinement of runaway electrons using an in-vessel helical coil*, [Nucl. Fusion 61, 106033 \(2021\)](#)
- C. Paz-Soldan**, et al, *Kink Instabilities of the Post-Disruption Runaway Electron Beam at Low Safety Factor*, [Plasma Phys. Control. Fusion 61, 054001 \(2019\)](#)
- C. Paz-Soldan**, C.M. Cooper, P. Aleynikov, et al, *Spatiotemporal Evolution of Runaway Electron Momentum Distributions in Tokamaks*, [Phys. Rev. Lett. 118, 255002 \(2017\)](#)
- D. Spong, W. Heidbrink, **C. Paz-Soldan** et al, *First Direct Observation of Runaway-Electron-Driven Whistler Waves in Tokamaks*, [Phys. Rev. Lett. 120, 155002 \(2018\)](#)
- C. Paz-Soldan**, R. Nazikian, et al, *Observation of Multimode Plasma Response and its Relationship to Density Pumpout and Edge-Localized Mode Suppression*, [Phys. Rev. Lett. 114, 105001 \(2015\)](#)
- R. Nazikian, **C. Paz-Soldan**, et al, *Pedestal Bifurcation and Field Penetration at the Threshold of Edge-Localized Mode Suppression in the DIII-D Tokamak*, [Phys. Rev. Lett. 114, 105002 \(2015\)](#)
- C. Paz-Soldan**, M.I. Brookhart, C.B. Forest, et al, *Stabilization of the Resistive Wall Mode by a Rotating Conducting Wall*, [Phys. Rev. Lett. 107, 245001 \(2011\)](#)

Full Publication List

Over twenty first-author and over 160 peer-reviewed journal publications, see below links and pages: [Google Scholar](#) (H-index 45), [ORCID](#), [Publons](#), [Scopus](#)

National and International Conference Invited Talks

- Novel path to Runaway Electron Mitigation via D2 Injection and Kink Instability (Rapporteur)*
International Atomic Energy Agency–Fusion Energy Conference Nice, France 2021
- Advances in Runaway Electron Control and Model Validation for ITER*
International Atomic Energy Agency–Fusion Energy Conference Ahmedabad, India 2018
- Spatio-Temporally Resolved Measurement of Runaway Electron Distributions during Dissipation*
American Physical Society–Division of Plasma Physics Meeting Milwaukee, WI 2017
- Optimization of the Plasma Response for the Control of Edge-Localized Modes with 3-D Fields*
International Atomic Energy Agency–Fusion Energy Conference Kyoto, Japan 2016
- Control of Non-Axisymmetric Fields with Static and Dynamic Boundary Conditions*
American Physical Society–Division of Plasma Physics Meeting Denver, CO 2013
- Stabilization of the Resistive Wall Mode and Error Field Reduction by a Rotating Conducting Wall*
American Physical Society–Division of Plasma Physics Meeting Salt Lake City, UT 2011