

## Carlos Paz-Soldan

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Associate Professor, Columbia University  
Applied Physics and Applied Mathematics  
School of Engineering and Applied Sciences

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### Professional Positions

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

### Education

<b>Ph.D.</b> , Physics	University of Wisconsin-Madison, 2007–2012
<b>M.Sc.</b> , Engineering Physics	University of Wisconsin-Madison, 2007–2009
<b>B.Sc.E.</b> , 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, General 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, <a href="#">Fusion Energy Sciences Advisory Committee</a> (FESAC), <i>US DOE</i>	2022-present
Chair, FESAC <a href="#">Decadal Plan</a> Sub-Committee, <i>US DOE</i>	2024-present
President, <a href="#">University Fusion Association</a>	2025-present
Vice-Chair, FESAC <a href="#">Facilities Construction Projects</a> Sub-Committee, <i>US DOE</i>	2023-2024
Co-Chair, <a href="#">Workforce Accelerator for Fusion Energy Technology Development</a>	2023-2024
Chair, User Board, <a href="#">DIII-D National Fusion Facility</a>	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 <a href="#">Award for Early Career Contrib. to Plasma Physics</a> , <i>American Physical Society</i>	2021
Marshall Rosenbluth <a href="#">Outstanding Doctoral Thesis Award</a> , <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 (Rapporteured)*  
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