

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, 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, [Fusion Energy Sciences Advisory Committee](#) (FESAC), *US DOE* 2022–present

Vice-Chair, FESAC [Facilities Construction Projects](#) Sub-Committee, *US DOE* 2023–present

Vice-President, *University Fusion Association* 2023–present

Co-Chair, [Workforce Accelerator for Fusion Energy Technology Development](#) 2023–present

Program Advisory Committee, *National Spherical Torus Experiment - Upgrade* 2021–present

Division of Plasma Physics Meeting Program Committee, *American Physical Society* 2018, 2022

Thomas Stix Award Committee, *American Physical Society* 2022

Marshall Rosenbluth Award Committee, *American Physical Society* 2013, 2021

Professional Honors

Thomas Stix [Award for Early Career Contrib. to Plasma Physics](#), *American Physical Society* 2021

Marshall Rosenbluth [Outstanding Doctoral Thesis Award](#), *American Physical Society* 2013

Doctoral Fellowship, *National Science and Engineering Research Council (NSERC)* 2009–2012

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Selected Publications (Reverse Chronological Order)

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 \(2023\)](#)

I.G. Stewart, R.S. Granetz, C.E. Myers, **C. Paz-Soldan**, et al, *Optimization of the equilibrium magnetic sensor set for the SPARC tokamak*, [Nucl. Fusion 63, 126014 \(2023\)](#)

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, N.W. Eidietis, E.M. Hollmann, et al, *Recent DIII-D Advances in Runaway Electron Measurement and Model Validation*, [Nucl. Fusion 59 066025 \(2019\)](#)

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 145 peer-reviewed journal publications, see below links and pages: [Google Scholar](#), [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