

Carlos Paz-Soldan

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Applied Physics and Applied Mathematics
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Research Experience

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

Co-Lead Principal Investigator, DOE Int’l Tokamak Research on 3D ELM Control 2019-present
Physics Basis, Optimization, and Control for Integrated 3D Edge Long-Pulse Tokamak Scenarios

Leader, ELM Control Research Area at DIII-D National Fusion Facility 2016-present
Responsible for research area tasked with identifying the solution to the control of the edge-localized mode (ELM). Roles include experiment selection, managing team dynamic, assisting in planning, executing, analyzing experiments, and developing strategic plans as well as five-year plan documents

Principal Investigator, GA Internal R&D Project: DIII-D New Capabilities 2020
Identify capability upgrade opportunities and develop them for inclusion in budget requests, working with full GA DIII-D research team to leverage expertise. Includes physics and operations divisions.

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

Principal Investigator, GA Internal R&D Project: Advanced 3-D Coilsets for DIII-D 2016-2017
Manage research budget to perform physics analysis, engineering conceptual design, and generate five-year plan documents for upgrade to DIII-D non-axisymmetric coils, leading to the ‘M-coil’

Leader, MHD+Macro Topical Group, US Burning Plasma Organization 2018-present

Expert, International Tokamak Physics Activity (ITPA) Pedestal and Edge Physics 2017-present

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

Physics Operator, DIII-D Tokamak 2014-present

Awards

Marshall N. Rosenbluth Outstanding Doctoral Thesis Award , <i>American Physical Society</i>	2013
Doctoral Fellowship, <i>National Science and Engineering Research Council (NSERC)</i>	2009–2012
Graduate Scholarship, <i>American Nuclear Society</i>	2008
Chancellor’s Scholarship, <i>Queen’s University at Kingston</i>	2003–2007
National Scholarship, <i>Canada Millennium Scholarship Foundation</i>	2003–2007

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Selected Publications

- C. Paz-Soldan**, *Plasma Performance and Operational Boundaries without ELMs in DIII-D*, [arXiv](#) (in review, appearing in 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)
- D. Weisberg, **C. Paz-Soldan**, Y.Q. Liu, N.C. Logan, *Optimizing multi-modal, non-axisymmetric plasma response metrics with additional coil rows on DIII-D*, [Nucl. Fusion 59, 086060](#) (2019)
- C. Paz-Soldan**, et al, *Kink Instabilities of the Post-Disruption Runaway Electron Beam at Low Safety Factor*, [Plasma Phys. Contrl. 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**, N.W. Eidietis, R. Granetz, et al, *Growth and decay of runaway electrons above the critical electric field under quiescent conditions*, [Phys. Plasmas 21, 022514](#) (2014)
- 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)

Other Publications

Over 20 first-author and over 100 peer-reviewed publications, see following links:
[Google Scholar](#), [ORCID](#), [Publons](#), [Mendeley](#), [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