

Bayesian optimization for physics and engineering applications • Whole-device integrated modeling for reactor design • Fusion reactor optimization with high-fidelity physics models • Turbulence and transport physics validation in tokamak plasmas

## RESEARCH EXPERIENCE

**MIT Plasma Science and Fusion Center (MIT PSFC)** – Cambridge (United States) September 2015 – present  
*Research Scientist* (May 2021 – present)

- Working on integrated modeling of tokamaks, reactor performance predictions and optimization, transport model validation.

*Postdoctoral Associate* (May 2019 – May 2021)

- Contributed to development of physics basis of SPARC (collaboration MIT-CFS) via integrated modeling for device optimization.
- Studied turbulence and transport in ASDEX Upgrade via advanced algorithms and perturbative techniques.
- Supported transport modeling of isotope effects in the JET tokamak (collaboration with MIT-ORNL).

*Research Assistant, graduate student* (September 2015 – May 2019)

- Resolved 20-year-old question in fusion research, resulting in a high-impact publication in *Physical Review Letters*.
- Conducted experiments as session leader in Alcator C-Mod and DIII-D tokamaks. Operated laser blow-off in Alcator C-Mod.
- Summer stay at General Atomics for the study of heat-pulses on DIII-D and power balance analysis in negative triangularity.
- Summer stay at Max-Planck-Institut für Plasmaphysik for the implementation of VITALS tool to study ASDEX Upgrade plasmas.

**Laboratory of Fluid Machines, Politecnico di Milano** - Milan (Italy) September 2014 – May 2015

*Research Consultant* (April 2015 – May 2015)

*Research Assistant, M.Sc. candidate* (September 2014 – April 2015)

- Optimized Organic Rankine Cycle (ORC) turbine stage, resulting in half pressure losses compared to original designs.
- Developed automatic shape-optimization tool for turbomachinery blades using evolutionary strategies and surrogate models.

**Drexel University** - Philadelphia, PA (USA) January 2014 – June 2014

*Research Assistant, M.Sc. candidate* (January 2014 – June 2014)

- Investigated CO<sub>2</sub> decomposition through micro-scale non-thermal plasma discharges via CFD simulations.

## EDUCATION

**Massachusetts Institute of Technology (MIT)** - Cambridge, MA (USA) May 2019

*Doctor of Philosophy (Ph.D.) in Nuclear Science and Engineering, specialization in Plasma Physics*

GPA: 4.8/5.0

- Relevant Coursework: Plasma Physics, Nuclear Fusion, Machine Learning, Optimization Methods

- Thesis: "Perturbative transport experiments and time-dependent modeling in Alcator C-Mod and DIII-D" (Del Favero thesis prize)

**Drexel University** - Philadelphia, PA (USA) June 2014

*Master of Science (M.Sc.) in Mechanical Engineering*

GPA: 4.0/4.0

- Relevant Coursework: Advanced Fluid Mechanics & Heat Transfer, Numerical Methods

Class rank: #1 (out of 49 students)

- Double-Degree Master's Thesis at Politecnico di Milano (Milan, Italy), Sept. 2014 – May 2015

- Thesis: "Development of shape-optimization tools for the aerodynamic design of turbomachinery blades" (Cátedra Repsol prize)

**Universidad Politécnica de Madrid** - Madrid (Spain) April 2013

Equivalent to *Bachelor of Science (B.Sc.) and Master of Science (M.Sc.) in Industrial & Energy Engineering*

GPA: 9.0/10.0

- Relevant Coursework: Nuclear Physics & Technology, Fluid Mechanics, Thermodynamics

Class rank: #1 (out of 419 students)

## HONORS, AWARDS & FELLOWSHIPS

- Forbes "30 Under 30" in Science Forbes Magazine, Dec. 2020
- Del Favero* Doctoral Thesis Prize for most innovative advance in the field MIT Nuclear Science and Engineering, Dec. 2019
- Young Engineer* Early Career Achievement Award Alumni Association ETSII-UPM, June 2018
- Manson Benedict* Award for Academic Excellence and Professional Promise MIT Nuclear Science and Engineering, May 2018
- MIT International Science and Technology Initiatives (MISTI) Scholarship MIT MISTI program, May 2018
- Award for the Best Student in Industrial and Energy Engineering (two awards) ETSII-UPM, Dec. 2015
- Repsol* Award for the Best Master's Thesis Project Cátedra Repsol ETSII-UPM, Dec. 2015
- Caja Ingenieros* Award for Excellent Academic Progress Caja Ingenieros UPM, Dec. 2015

- *La Caixa* Fellowship for graduate studies in North America Banking Foundation la Caixa, July 2014
- Excellence in Performance Award Drexel University, June 2014
- ERASMUS Scholarship for graduate studies European Union & Government of Spain, Apr. 2014
- *Enrique Rodríguez-Marín* Award for Excellent Academic Progress Romanillos Foundation, Mar. 2014
- Award for Excellent Academic Progress (*received twice*) Government of Madrid, Jan 2014 & Jan. 2011
- Atlantis Fellowship for Graduate Studies, EAGLES Consortium FIPSE U.S. & European Union, Apr. 2013
- High-Performing Student Award ETSII-UPM, Dec. 2011
- Award for the Best Results in the University Entrance Test Universidad Complutense de Madrid, Mar. 2010

## SERVICE, MENTORSHIP AND FUNDING ACTIVITIES

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### ▪ **Mentorship:**

- Co-advisor of MIT graduate student V. Galvan (September 2022 – present)  
Topic: Surrogate modeling for transport predictions in burning plasmas
- Advisor of MIT graduate student A. Saltzman (September 2021 – present)  
Topic: Integrated transport modeling of multi-channel interactions
- Thesis Reader and Supervision Committee member of MIT graduate student C. Yoo (July 2021 – present)  
Thesis: “*Database-driven studies of turbulence at ASDEX Upgrade*” (exp. Spring 2024)
- Supervision Committee member of MIT graduate student R. Bielajew (May 2020 – present).  
Thesis: “*Experimental Study of Edge Electron Temperature Fluctuations in L-mode, I-mode and H-mode Plasmas at ASDEX Upgrade*” (exp. Spring 2023)
- Advisor of MIT undergraduate student S. Kantamneni (Spring 2022).  
Project: “*Analyzing Alcator C-Mod Data to Derive a L-Mode Boundary Condition for SPARC*”
- Advisor of MIT undergraduate student B. Spector (Summer 2021).  
Project: “*Characterization and Performance Predictions of L-mode Plasmas in the SPARC Tokamak*”
- Founder of MFE Integrated Modeling (MFE-IM) group at MIT PSFC (August 2021 – present)

### ▪ **Official Roles, Committees and Boards Memberships:**

- Co-lead (with Dr. N. Howard) of the SPARC Performance & Transport group at MIT.
- Member of International Program Advisory Committee (IPAC) for IAEA Technical Meeting on Fusion Data Processing, Validation and Analysis (February 2021 – present).
- Member of Executive Committee for U.S. Transport Taskforce Workshop (May 2021 – present).
- Responsible Officer for TRANSP at the MIT PSFC (2019 – present).
- Member of Executive Committee of Spain@MIT association (2016 – 2019).
- Students Representative at ETSII – Universidad Politécnica de Madrid (2009 – 2013).

### ▪ **Instruction, Moderation and Chair Activities:**

- Chairman and program committee member for the US/EU Transport Taskforce Workshop (April 2022).
- Deputy chairman of MFE Science Meetings at MIT PSFC (July 2022 – present).
- Co-lead of “Needs for burning plasma operation and ITER” session at TRANSP Users Virtual Workshop (January 2022).
- Chairman and organizer of “Deep Learning” session at the 4th IAEA Technical Meeting on Fusion Data Processing, Validation and Analysis (December 2021).
- Mentor for graduate course at MIT NSE: 22.63 Engineering Principles for Fusion Reactors (Fall 2020).
- Moderator for 1st Computational Physics School for Fusion Research at MIT (August 2019).
- Student Grader for graduate course at MIT NSE: 22.611 Introduction to Plasma Physics I (Fall 2016).

### ▪ **Reviewer and Referee Activities:**

- Refereed for journals (2018 – present): *IOP Nuclear Fusion*, *IEEE Transactions on Plasma Science* and *AIP Physics of Plasmas*.
- Proposal reviewer (2021 – present): U.S. Department of Energy – Office of Science.

### ▪ **Grant Proposal Writing and Contributions:**

- Co-lead of ASCR Leadership Computing Challenge (ALCC) Proposal on Gyrokinetic Predictions for Burning Plasmas.
- Co-lead of 5-year MIT/CFS Research Project Proposal (RPP) on Integrated Physics, Performance Projection, and Optimization.
- Lead author on section of MFE Cooperative Agreement 5-year DOE research proposal for MIT PSFC.
- Lead author on DOE research proposal to collaborate with Oak Ridge National Lab to perform research at the JET tokamak.
- Lead author on Facebook Research grant on machine learning and Bayesian optimization to support students at MIT.

## FIRST-AUTHOR PEER-REVIEWED JOURNAL PUBLICATIONS

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9. **P. Rodriguez-Fernandez**, N.T. Howard, and J. Candy, "Nonlinear gyrokinetic predictions of SPARC burning plasma profiles enabled by surrogate modeling", *Nucl. Fusion* 62, 076036 (2022). <https://doi.org/10.1088/1741-4326/ac64b2>
8. **P. Rodriguez-Fernandez**, C. Angioni, and A. E. White, "Local Transport Dynamics of Cold Pulses in Tokamak Plasmas", *Rev. Mod. Plasma Phys.* 6, 10 (2022). <https://doi.org/10.1007/s41614-022-00071-7>
7. **P. Rodriguez-Fernandez**, A.J. Creely, M.J. Greenwald, D. Brunner, S.B. Ballinger, C.P. Chrobak, D.T. Garnier, R. Granetz, Z.S. Hartwig, N.T. Howard, J.W. Hughes, J.H. Irby, V.A. Izzo, A.Q. Kuang, Y. Lin, E.S. Marmor, R.T. Mumgaard, C. Rea, M.L. Reinke, V. Riccardo, J.E. Rice, S.D. Scott, B.N. Sorbom, J.A. Stillerman, R. Sweeney, R.A. Tinguely, D.G. Whyte, J.C. Wright and D.V. Yuryev, "Overview of the SPARC physics basis towards the exploration of burning-plasma regimes in high-field, compact tokamaks", *Nucl. Fusion* 62, 042003 (2022). <https://doi.org/10.1088/1741-4326/ac1654>
6. **P. Rodriguez-Fernandez**, N. T. Howard, M. J. Greenwald, A. J. Creely, J. W. Hughes, J. C. Wright, C. Holland, Y. Lin, F. Sciortino and the SPARC team, "Predictions of core plasma performance for the SPARC tokamak", *Journal of Plasma Physics* 86(5), 865860503 (2020). <https://doi.org/10.1017/S0022377820001075>
5. **P Rodriguez-Fernandez**, A E White, N T Howard, B A Grierson, L Zeng, X Yuan, G M Staebler, M E Austin, T Odstrcil, T L Rhodes, F Sciortino, J E Rice, K Thome, C Angioni, E Fable and O Meneghini, "Predict-first Experiments and Modeling of Perturbative Cold Pulses in the DIII-D Tokamak", *Phys. Plasmas* 26, 062503 (2019). <https://doi.org/10.1063/1.5096800>
4. **P Rodriguez-Fernandez**, A E White, N T Howard, B A Grierson, X Yuan, G M Staebler, J E Rice, C Angioni, N M Cao, A J Creely, E Fable, M J Greenwald, A E Hubbard, J W Hughes, J H Irby and F Sciortino, "Perturbative Transport Modeling of Cold-Pulse Dynamics in Alcator C-Mod Ohmic Plasmas", *Nucl. Fusion* 59, 066017 (2019) <https://doi.org/10.1088/1741-4326/ab1575>
3. **P Rodriguez-Fernandez**, A E White, N T Howard, B A Grierson, G M Staebler, J E Rice, X Yuan, N M Cao, A J Creely, M J Greenwald, A E Hubbard, J W Hughes, J H Irby and F Sciortino, "Explaining cold-pulse dynamics in tokamak plasmas using local turbulent transport models", *Phys. Rev. Lett.* 120, 075001 (2018). <http://dx.doi.org/10.1103/PhysRevLett.120.075001>
2. **P Rodriguez-Fernandez**, A E White, A J Creely, M J Greenwald, N T Howard, F Sciortino and J C Wright, "VITALS: A surrogate-based optimization framework for the accelerated validation of plasma transport codes", *Fusion Technol.* 74:1-2, 65-76 (2018). <http://dx.doi.org/10.1080/15361055.2017.1396166>
1. **P Rodriguez-Fernandez**, J E Rice, N M Cao, A J Creely, N T Howard, A E Hubbard, J H Irby and A E White, "On the correlation between "non-local" effects and intrinsic rotation reversals in Alcator C-Mod", *Nucl. Fusion* 57, 074001 (2017). <http://dx.doi.org/10.1088/1741-4326/aa6e89>

## FIRST-AUTHOR CONFERENCE PROCEEDINGS

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3. **P. Rodriguez-Fernandez**, S.B. Ballinger, D.T. Garnier, R. Granetz, M.J. Greenwald, Z.S. Hartwig, N.T. Howard, J.W. Hughes, J.H. Irby, A.Q. Kuang, Y. Lin, E.S. Marmor, C. Rea, J.E. Rice, J.A. Stillerman, R. Sweeney, R.A. Tinguely, D.G. Whyte, J.C. Wright, A.J. Creely, D. Brunner, C.P. Chrobak, R.T. Mumgaard, M.L. Reinke, V. Riccardo, S.D. Scott, B.N. Sorbom, D.V. Yuryev, V.A. Izzo, "Overview of the SPARC physics basis towards the exploration of burning-plasma regimes in high-field, compact tokamaks", *Proceedings of the 28th IAEA Fusion Energy Conference*, IAEA-CN-286 OV/P-4.
2. **P Rodriguez-Fernandez**, A E White, N T Howard, J E Rice, F Sciortino, N M Cao, A J Creely, M J Greenwald, A E Hubbard, J W Hughes, J H Irby, X Yuan, B A Grierson, G M Staebler, C Angioni and E Fable, "Modeling of Cold-Pulse Propagation and Associated Phenomena in Tokamak Plasmas", *Proceedings of 27th IAEA Fusion Energy Conference (Gandhinagar)*, IAEA-CN-258 EX/10-3.
1. **P Rodriguez-Fernandez** and G Persico, "Automatic design of ORC turbine profiles using evolutionary algorithms", *ASME ORC 3rd Int'l Seminar on ORC Power Systems*, Brussels (Belgium), Oct 2015. <http://bit.ly/2ZqGcZx>

## CO-AUTHORED PEER-REVIEWED JOURNAL PUBLICATIONS

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23. R. Bielajew, G. D. Conway, M. Griener, T. Happel, K. Hofler, N. T. Howard, A. E. Hubbard, W. McCarthy, P. A. Molina Cabrera, T. Nishizawa, **P. Rodriguez-Fernandez**, D. Silvagni, B. Vanovac, D. Wendler, C. Yoo, A. E. White, and ASDEX Upgrade Team, "Edge turbulence measurements in L-mode and I-mode at ASDEX Upgrade", *Physics of Plasmas* 29, 052504 (2022). <https://doi.org/10.1063/5.0088062>

22. M. E. Fenstermacher for the DIII-D Team: J. Abbate, ..., **P. Rodriguez-Fernandez**, ... and M. Zuin, "DIII-D research advancing the physics basis for optimizing the tokamak approach to fusion energy", Nucl. Fusion 62 042024 (2022). <https://doi.org/10.1088/1741-4326/ac2ff2>
21. G. M. Staebler, M. Knölker, P. B. Snyder, C. Angioni, E. Fable, T. Luda di Cortemiglia, C. Bourdelle, J. Garcia, J. Citrin, M. Marin, HT. Kim, J. Kinsey, CY. Lee, YS. Na, JM. Park, **P. Rodriguez-Fernandez** and M. Wu, "Advances in prediction of tokamak experiments with theory-based models", Nucl. Fusion 62 042005 (2022). <https://doi.org/10.1088/1741-4326/ac1eaf>
20. N. T. Howard, C. Holland, T. L. Rhodes, J. Candy, **P. Rodriguez-Fernandez**, M. Greenwald, A. E. White and F. Sciortino, "The role of ion and electron-scale turbulence in setting heat and particle transport in the DIII-D ITER baseline scenario", Nucl. Fusion 61 106002 (2021). <https://doi.org/10.1088/1741-4326/ac1bc2>
19. F. Sciortino, N. T. Howard, R. Reksoatmodjo, A. R. Foster, J. W. Hughes, E. S. Marmor, M. A. Miller., S. Mordijck, T. Odstrcil, T. Pütterich, M. L. Reinke, J. E. Rice and **P. Rodriguez-Fernandez**, "Experimental inference of neutral and impurity transport in Alcator C-Mod using high-resolution X-ray and Ultra-Violet spectra", Nucl. Fusion 61 126060 (2021). <https://doi.org/10.1088/1741-4326/ac32f2>
18. N. T. Howard, **P. Rodriguez-Fernandez**, C. Holland, J. E. Rice, M. Greenwald, J. Candy, and F. Sciortino, "Gyrokinetic simulation of turbulence and transport in the SPARC tokamak", Physics of Plasmas 28, 072502 (2021). <https://doi.org/10.1063/5.0047789>
17. J. E. Rice, N. M. Cao, T. Tala, C. Chrystal, M. J. Greenwald, J. W. Hughes, E. S. Marmor, M. L. Reinke, **P. Rodriguez-Fernandez** and A. Salmi, "Dimensionless parameter scaling of intrinsic torque in C-Mod enhanced confinement plasmas", Nucl. Fusion 61, 026013 (2021). <https://doi.org/10.1088/1741-4326/abcb26>
16. A. J. Creely, M. J. Greenwald, S. B. Ballinger, D. Brunner, J. Canik, J. Doody, ..., **P. Rodriguez-Fernandez**, ..., et al., "Overview of the SPARC Tokamak", Journal of Plasma Physics 86(5), 865860502 (2020). <https://doi.org/10.1017/S0022377820001257>
15. J. W. Hughes, N. T. Howard, **P. Rodriguez-Fernandez**, A. J. Creely, A. Q. Kuang, P. B. Snyder, T. M. Wilks, R. Sweeney, and M. Greenwald. 2020. "Projections of H-Mode Access and Edge Pedestal in the SPARC Tokamak", Journal of Plasma Physics 86(5), 865860504 (2020). <https://doi.org/10.1017/S0022377820001300>
14. S. D. Scott, G. J. Kramer, E. A. Tolman, A. Snicker, J. Varje, K. Särkimäki, J. C. Wright, and **P. Rodriguez-Fernandez**, "Fast-Ion Physics in SPARC", Journal of Plasma Physics 86(5), 865860508 (2020). <https://doi.org/10.1017/S0022377820001087>
13. F. Sciortino, N. T. Howard, E. S. Marmor, T. Odstrcil, N. M. Cao, R. Dux, A. E. Hubbard, J. W. Hughes, J. H. Irby, Y. Marzouk, L. M. Milanese, M. L. Reinke, J. E. Rice and **P. Rodriguez-Fernandez**, "Inference of experimental radial impurity transport on Alcator C-Mod: Bayesian parameter estimation and model selection", Nucl. Fusion 60 126014 (2020). <https://doi.org/10.1088/1741-4326/abae85>
12. N. M. Cao, J. E. Rice, P. H. Diamond, A. E. White, M. A. Chilenski, P. C. Ennever, J. W. Hughes, J. Irby, M. L. Reinke, **P. Rodriguez-Fernandez**, and Alcator C-Mod Team, "Evidence and modeling of turbulence bifurcation in L-mode confinement transitions on Alcator C-Mod", Physics of Plasmas 27, 052303 (2020). <https://doi.org/10.1063/1.5144444>
11. A. J. Creely, L. M. Milanese, E. A. Tolman, J. H. Irby, S. B. Ballinger, S. Frank, A. Q. Kuang, B. L. Linehan, W. McCarthy, K. J. Montes, T. Mouratidis, J. F. Picard, **P. Rodriguez-Fernandez**, A. M. Rosenthal, A. J. Sandberg, F. Sciortino, R. A. Simpson, R. A. Tinguely, M. Zhou, and A. E. White, "Design study of a combined interferometer and polarimeter for a high-field, compact tokamak", Physics of Plasmas 27, 042516 (2020). <https://doi.org/10.1063/1.5142638>
10. T. Fülöp, P. Helander, O. Vallhagen, O. Embréus, L. Hesslow, P. Svensson, A. J. Creely, N. T. Howard and **P. Rodriguez-Fernandez**, "Effect of plasma elongation on current dynamics during tokamak disruptions", Journal of Plasma Physics, 86(1), 474860101 (2020). <https://doi.org/10.1017/S002237782000001X>
9. C. Angioni, E. Fable, F. Ryter, **P. Rodriguez-Fernandez** and T. Pütterich, "The local nature of the plasma response to cold pulses with electron and ion heating at ASDEX Upgrade", Nucl. Fusion 59, 106007 (2019). <https://doi.org/10.1088/1741-4326/ab313f>
8. N. M. Cao, J. E. Rice, P. H. Diamond, A. E. White, S. G. Baek, M. A. Chilenski, J. W. Hughes, J. Irby, M. L. Reinke, **P. Rodriguez-Fernandez** and the Alcator C-Mod Team, "Hysteresis as a Probe of Turbulent Bifurcation in Intrinsic Rotation Reversals on Alcator C-Mod" Nucl. Fusion (2019). <https://doi.org/10.1088/1741-4326/ab3b38>
7. A. J. Creely, **P. Rodriguez-Fernandez**, G. D. Conway, S. J. Freethy, N. T. Howard, A. E. White and the ASDEX Upgrade Team, "Criteria for the Importance of Multi-scale Interactions in Plasma Turbulent Transport Simulations", Plasma Phys. Control. Fusion 61, 085022 (2019). <https://doi.org/10.1088/1361-6587/ab24ae>

6. R A Tinguely, A Rosenthal, R Simpson, S B Ballinger, A J Creely, S Frank, A Q Kuang, B L Linehan, W McCarthy, L M Milanese, K J Montes, T Mouratidis, J F Picard, **P Rodriguez-Fernandez**, A J Sandberg, F Sciortino, E A Tolman, M Zhou, B N Sorbom, Z S Hartwig and A E White, "Neutron Diagnostics for the Physics of a High-Field, Compact, Q $\geq$ 1 Tokamak", Fusion Eng. Des. 143, pp. 212-225 (2019). <https://doi.org/10.1016/j.fusengdes.2019.03.148>
5. G Persico, **P Rodriguez-Fernandez** and A Romei, "High-Fidelity Shape-Optimization of Non-Conventional Turbomachinery by Surrogate Evolutionary Strategies", ASME. J. Turbomach. 141(8), 081010-081010-11 (2019) <http://dx.doi.org/10.1115/1.4043252>
4. J Rice, F Rosmej, N Cao, M Chilenski, N Howard, A Hubbard, J Hughes, J Irby, Y Lin, **P Rodriguez-Fernandez**, S Wolfe, S Wukitch, M Bitter, L Delgado-Aparicio, K Hill and M Reinke, "X-ray Observations of K $\beta$  Emission from Medium Z He-like Ions in C-Mod Tokamak Plasmas", J. Phys. B: At. Mol. Opt. Phys. 51, 035702 (2018). <http://dx.doi.org/10.1088/1361-6455/aaa17f>
3. N T Howard, C Holland, A E White, M J Greenwald, **P Rodriguez-Fernandez**, J Candy and A J Creely, "Multi-scale gyrokinetic simulations of an Alcator C-Mod, ELM-y H-mode plasma", Plasma Phys. Control. Fusion 60, 014034 (2017). <http://dx.doi.org/10.1088/1361-6587/aa9148>
2. A J Creely, N T Howard, **P Rodriguez-Fernandez**, N Cao, A E Hubbard, J W Hughes, J E Rice, A E White, J Candy, G M Staebler, G D Conway, S J Freethy and C Sung, "Validation of nonlinear gyrokinetic simulations of L- and I- mode plasmas on Alcator C-Mod", Phys. Plasmas 24, 0.56104 (2017). <http://dx.doi.org/10.1063/1.4977466>
1. B LaBombard, A Q Kuang, D Brunner, I Faust, R Mumgaard, M L Reinke, J L Terry, N Howard, J W Hughes, M Chilenski, Y Lin, E Marmor, J E Rice, **P Rodriguez-Fernandez**, G Wallace, D G White, S Wolfe and S Wukitch, "Impurity screening behavior of the high-field side scrape-off layer in near-double-null configurations: prospect for mitigating plasma-material interactions on RF actuators and first-wall components", Nucl. Fusion 57, 076021 (2017). <http://dx.doi.org/10.1088/1741-4326/aa6dd2>

## INVITED CONTRIBUTIONS TO CONFERENCES

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10. 28th IAEA Fusion Energy Conference, Nice (France), May 10-15 2021. "Overview of the SPARC physics basis towards the exploration of burning-plasma regimes in high-field, compact tokamaks" (Overview poster)
9. 4th Asia-Pacific Conference on Plasma Physics, Association of Asia-Pacific Physical Societies, Virtual Meeting, Oct 26-31 2020. "On the local nature of cold-pulse experiments in Alcator C-Mod, DIII-D and ASDEX Upgrade"
8. 2nd International Conference of Data Driven Plasma Science, Marseille (France), May 13-17 2019. "Surrogate-Based Optimization Techniques for the Validation of Plasma Transport Models"
7. ITPA Transport and Confinement Topical Group Meeting Spring 2019, Austin (TX), Mar 25-27 2019. "Multi-machine study of cold-pulse dynamics: Towards a local model for the temperature inversion effect".
6. 60th Annual Meeting of the APS Division of Plasma Physics, Portland (OR), Nov 5-9 2018. "Understanding cold-pulse dynamics in tokamak plasmas using local turbulent transport models".
5. 27th IAEA Fusion Energy Conference, Gandhinagar (India), Oct 22-27 2018. "Explaining cold-pulse dynamics in tokamak plasmas using local turbulent transport models".
4. 23rd Joint EU-US Transport Task Force Meeting, Sevilla (Spain), Sep 11-14 2018. "Modeling of cold-pulse dynamics in Alcator C-Mod and DIII-D: A local turbulent transport approach".
3. US Transport Task Force Workshop, San Diego (CA), May 8-1 2018. "Prediction of cold-pulse dynamics in tokamak plasmas using quasilinear turbulent transport models".
2. ITPA Transport and Confinement Topical Group Meeting Spring 2018, Daejeon (Republic of Korea), Apr 9-11 201. "An introduction to VITALS: surrogate models to accelerate transport model validation".
1. ITPA Transport and Confinement Topical Group Meeting Spring 2018, Daejeon (Republic of Korea), Apr 9-11 201. "Modeling cold-pulse propagation in Alcator C-Mod plasmas using TGLF".

### Other contributions to conferences:

- 11 contributed oral presentations:  
 APS 2022, US-TTF 2022, APS-DPP 2021, EU-TTF 2021, US-TTF 2021, APS-DPP 2020, APS-DPP 2019, APS-DPP 2018, IAEA-TM 2017, APS-DPP 2016, GK-TWGM 2016.
- 6 contributed poster presentations:  
 EPS 2021, EPS 2019, EPS 2018, APS-DPP 2017, US-TTF 2017, US-TTF 2016.

## INVITED SEMINARS, MEDIA CONTRIBUTIONS AND OUTREACH

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### ▪ **Guest Seminar Speaker/Lecturer:**

- Guest lecturer at the MIT Computational Physics School for Fusion Research (CPS-FR), MIT, August 2022.
- Invited seminar speaker at Universidad Nacional Autónoma de México, June 2022.
- Invited speaker at *Becarios Knowledge Day* organized by La Caixa Becarios Association, April 2022
- Invited seminar speaker at Universidad Nacional de La Plata, Argentina, October 2021.
- Invited seminar speaker for Nuclear Science & Technology graduate program and Erasmus-Mundus at UPM, June 2021.
- Invited seminar speaker for Association of Spanish Scientists in Sweden, June 2021.
- Invited seminar speaker at University of Colorado Boulder, Boulder (CO), April 2021.
- Invited seminar speaker for MIT Independent Activities Period, January 2021.
- Invited seminar speaker at University of Wisconsin-Madison, October 2020.
- Invited speaker at *Frontiers of Plasma Physics Colloquium*, organized by the Journal of Plasma Physics, October 2020.
- Lecturer at *Del Favero Prize* ceremony, MIT Nuclear Science and Engineering, Cambridge (MA), December 2019.
- Invited seminar speaker at Dutch Institute of Fundamental Energy Research DIFFER, Eindhoven (Netherlands), Aug 2018.
- Signature speaker at 2018 MIT NSE Graduate Research Expo, Cambridge (MA), March 2018.

### ▪ **Outreach Activities:**

- Invited speaker for the *Master on Leadership in Engineering & Architecture* organized by UPM & FRdP Foundation, July 2022.
- Script co-developer and speaker in *Introduction to Fusion* video (2022, <https://bit.ly/3wT8xvf>).
- Invited speaker at *Frontiers of Innovation & Entrepreneurship* workshop, organized by MIT Sloan & FRdP Foundation, June 2019.
- Invited speaker at *Call for Talent 2019* workshop, organized by Universidad-Empresa & FRdP Foundations, June 2019.
- Invited speaker at *Call for Talent 2018* workshop, organized by Universidad-Empresa & FRdP Foundations, November 2018.
- Speaker at 2<sup>nd</sup> Joint Meeting of Spanish Scientists in US, Cambridge (MA), June 2017.
- Participant of *PSFC Education and Outreach* events (2015 – 2019).
- Organizer of fusion outreach events for *la Caixa Fellows Association* (2015 – 2019).

### ▪ **Relevant Media Articles, Interviews and Documentaries:**

- Features in press about Forbes 30 Under 30 (2020, <https://bit.ly/2JLSJEB>, <https://bit.ly/36HmNKx>)
- Article for Cambridge University Press on the publication of the SPARC Physics Basis (2020, <https://bit.ly/36Uv6mW>).
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- TV Appearances for fusion outreach: *La Sexta* (2018, <http://bit.ly/321MyQz>) and *Telemadrid* (2019, <http://bit.ly/33AD6UF>).
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