

Brendan William SHANAHAN

PERSONAL INFORMATION

EMAIL: brendan.shanahan@ipp.mpg.de

CURRENT POSITION

2022 - PRESENT	Physicist
2016 - 2022	Postdoctoral Researcher <i>Max Planck Institut für Plasmaphysik, Teilinstitut Greifswald</i> Recipient of 2018 EUROfusion researcher grant Developing a fluid plasma turbulence framework for use in nonaxisymmetric geometries.

EDUCATION

2016 PhD in PHYSICS, **University of York**, York, England
Thesis: Modelling of magnetic null points using BOUT++ | Advisor: Dr. Ben DUDSON

2012 MA in PLASMA PHYSICS, **University of Wisconsin, Madison**, Madison, WI, USA
Research Supervisor: Prof. David ANDERSON

2011 MSc in Fusion Energy, **University of York**, York, England
Thesis: Infrared Thermography on Transient Events in MAST
Granted DISTINCTION
Research Supervisor: Dr. Andrew THORNTON

2009 BS in Physics, **University of Dayton**, Dayton, OH, USA
Minor in Mathematics | Graduated *Cum Laude*

SELECTED PUBLICATIONS

PRIMARY AUTHOR:

*indicates co-first authorship

B Shanahan, C Killer, G Pechstein, S A Henneberg, G Fuchert, and O Grulke “Estimating the error in filament propagation measurement using a synthetic probe”, *Plasma Physics and Controlled Fusion* **63** 125018 (2021)

C Killer*, **B Shanahan***, O Grulke, M Endler, K Hammond, L Rudischhauser and the W7-X Team. “Plasma filaments in the scrape-off layer of Wendelstein 7-X”, *Plasma Physics and Controlled Fusion* **62** 085003 (2020)

B Shanahan, and P Huslage. “Filament simulations in regions of highly-varying parallel connection length”, *Journal of Plasma Physics* **86** (3) 905860314 (2020)

B W Shanahan, B D Dudson and P A Hill. “Fluid simulations of plasma filaments in stellarator geometries with BSTING”, *Plasma Physics and Controlled Fusion* **61** 0250007 (2019)
arXiv preprint: [arXiv:1808.08899](https://arxiv.org/abs/1808.08899)

B W Shanahan and B D Dudson. “The effects of non-uniform drive on plasma filaments”, *Journal of Physics; Conference Series* **1125** 012018 (2018)
arXiv preprint: [arXiv:1810.04584](https://arxiv.org/abs/1810.04584)

B W Shanahan and B D Dudson. “Blob Dynamics in TORPEX poloidal null configurations”, *Plasma Physics and Controlled Fusion* **58** 125003 (2016)
arXiv preprint: [arXiv:1605.00963](https://arxiv.org/abs/1605.00963)

B W Shanahan, P Hill, and B D Dudson. “Towards nonaxisymmetry; initial results using the Flux Coordinate Independent method in BOUT++”, *Journal of Physics; Conference Series* **775** 012012 (2016)
arXiv preprint: [arXiv:1609.06603](https://arxiv.org/abs/1609.06603)

B W Shanahan and B D Dudson. “X-point modelling in linear configurations using BOUT++”, *Journal of Physics; Conference Series* **561** 012015 (2014)

OTHERWISE AUTHORED:

P Hill, **B W Shanahan**, and B D Dudson. “Dirichlet boundary conditions for arbitrary-shaped boundaries in stellarator-like magnetic fields for the Flux-Coordinate Independent method”, *Computer Physics Communications* 213 9-18 (2017)
arXiv preprint: [arXiv:1608.02416](https://arxiv.org/abs/1608.02416)

J Leddy, B Dudson, M Romanelli, **B Shanahan** and N Walkden. “A novel flexible field-aligned coordinate system for tokamak edge plasma simulation”, *Computer Physics Communications* 212 59-68 (2017)
arXiv preprint: [arXiv:1604.05876](https://arxiv.org/abs/1604.05876)

S L Semiatin, **B W Shanahan** and F Meisenkothen. “Hot rolling of gamma titanium aluminide foil”, *Acta Materialia* 58 44464457 (2010)

CONFERENCE ORAL CONTRIBUTIONS

2020	Varenna Theory Conference*
2019	International Stellarator and Heliotron Workshop*
2018	BOUT++ Workshop*
2017	IPP Internal Theory meeting
2016	American Physical Society, Division of Plasma Physics
2015	American Physical Society, Division of Plasma Physics Institute of Physics, Plasma Physics Group
2014	American Physical Society, Division of Plasma Physics FuseNet PhD Conference

*indicates invited contribution

CONFERENCE POSTER PRESENTATIONS

2019	European Physical Society, Plasma Physics Conference
2018	Varenna Theory Conference European Physical Society, Plasma Physics Conference
2016	Varenna Theory Conference
2015	International Stellarator and Heliotron Workshop European Physical Society, Plasma Physics Conference
2014	Joint Varenna-Lausanne Fusion Theory Workshop Institute of Physics Plasma Physics Group
2013	Carolus Magnus Summer School FuseNet PhD conference

EXPERIMENTAL RESEARCH EXPERIENCE

JUNE 2012 - DEC 2012	Research Assistant on the HELICALLY SYMMETRIC EXPERIMENT <i>University of Wisconsin-Madison, Madison, WI, USA</i> Conducted biased probe confinement experiments on the HSX stellarator and learned the physics and operations of the Charge Exchange Recombination Spectroscopy system.
JUNE 2011 - AUG 2011	Postgraduate Student Researcher at MAST <i>Culham Centre for Fusion Energy, Culham, UK</i> Researched divertor heatloads during transient events such as HL transitions and Edge Localized Modes (ELMs) on the Mega-Ampere Spherical Tokamak using infrared thermography.
SEP 2008 - AUG 2009	Federal Contractor <i>Wright-Patterson Air Force Base, Dayton, OH, USA</i> Employed under SOCHE Student Research Program Researched intergranular properties at high temperatures of materials used in thermal protection systems on hypersonic aircrafts.

TEACHING EXPERIENCE

- OCT 2014 - MAR 2015 | Demonstrator
University of York, York UK
Along with the lecturer, I helped students in two separate computational laboratories by demonstrating computational methods and explaining plasma physics phenomena.
- AUG 2011 - MAY 2012 | Teaching Assistant
University of Wisconsin-Madison, Madison, WI, USA
Taught laboratories, led discussion sections, and graded assignments for two introductory physics courses.
Awarded "Rookie of the year" for my performance as a Teaching Assistant based on, among other factors, student evaluations.
- AUG 2007 - DEC 2009 | Review Leader
University of Dayton, Dayton, OH, USA
For an introductory level physics course, I led review sessions, graded assignments, and assisted the professor in any tasks he or she asked.
Review sessions consisted of recalling lectures, explaining homework problems, and any other issues with which the students sought assistance.

ACADEMIC RECOGNITION

- 2018 - PRESENT | IPP Wissenschaftlerrat Mitglieder
Elected to represent the stellarator theory division to the "Scientist Representative Council", which serves to protect and further the interests of scientists at the Max-Planck-Institut für Plasmaphysik
- 2014 - PRESENT | Referee for Nuclear Fusion, Journal of Physics; Conference Series, Journal of Physics D
- 2018 - 2020 | EUROfusion Researcher Grant recipient
Awarded to a handful of postdoctoral researchers each year, the ERG promotes "excellence" in early career researchers and covers 2 years of salary and research expenses.
- 2013 - 2016 | W W Smith fund recipient
Awarded to postgraduate students with outstanding research
- 2015 | FuseNet funding for Education Activities
Funding awarded to participate in fusion training activities, in this case the 2015 International Stellarator and Heliotron Workshop
- 2015 | C R Barber Trust Fund
Institute of Physics travel funding award
- 2013 - 2014 | Student Representative to the Board of Studies
University of York, York, UK
Elected to represent the students enrolled in Physics PhD program
Mediated and facilitated communication between the academic staff and students.
Organized the Postgraduate Student Conference within the physics department.
- 2012 | Physics Department Rookie of the Year
University of Wisconsin-Madison, Madison, WI, USA
Awarded to an outstanding first year graduate student employed as a Teaching Assistant.
- 2010 - 2011 | Student Representative to the Board of Studies
University of York, York, UK
Elected to represent the students enrolled in the MSc in Fusion Energy
Mediated and facilitated communication between the academic staff and students.

- 2010 **Sigma Pi Sigma Award of Merit in Physics**
 ΣΠΣ
 Awarded to a graduating physics major who has achieved exceptional aptitude in physics.
- 2009 **Sigma Pi Sigma Inductee**
 ΣΠΣ
 Inducted into the national physics honor society, which honors outstanding scholarship in physics
- 2009 **Alpha Sigma Tau Inductee**
University of Dayton, Dayton, OH, USA
 Inducted into the University of Dayton's scholar society, recognizing successful graduate achieving a GPA of 3.5 or higher.
- 2009 **President, Society of Physics Students**
University of Dayton, Dayton, OH, USA
 Elected to help manage all affairs concerning the students within the department.
- 2008 **Caesar Castro Award of Excellence**
University of Dayton, Dayton, OH, USA
 Awarded to one student each year, honoring a student who has shown academic excellence in physics at the University of Dayton
- 2006 - 2009 **Honors Student**
University of Dayton, Dayton, OH, USA
 I have been recognized as an honors student, having maintained a GPA of at least 3.5 and Dean's list acknowledgment for every semester in my undergraduate career.
- 2006 - 2009 **President's Scholarship**
University of Dayton, Dayton, OH, USA
 Recognizes academic Merit.

SKILLS

- PROGRAMMING LANGUAGES: Python, C++, IDL, Fortran
- SOFTWARE PROFICIENCY: \LaTeX , LabView, MATLAB, Mathematica
- PHYSICAL SKILLS: Trained in Machining, Soldering, Carpentry, Electrical Safety, et al.
- PREVIOUSLY TRAINED SKILLS: Trained to use multiple Scanning Electron Microscopes; FEI Quanta, XL 30, Leica Cambridge Stereoscan 360FE, et al.
- SPOKEN LANGUAGE: English (native), German (B1 certification achieved June 2018, 92%)
- INTERPERSONAL: Communicates clearly and concisely. Comfortable leading a team or fulfilling a more subordinate role.
- PERSONAL INTERESTS: Elected Tech Manager (2015-1016) at the University of York Drama Society – voted the society's most valuable contributor and led a crowd-funding campaign to secure £5,000 for a tech upgrade.

REFERENCES

Available upon request.