Iván Calvo

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Current positions

Feb.'21 – today Research Professor, *Laboratorio Nacional de Fusión* (LNF), CIEMAT.

Apr.'19 – today Head of Theory at LNF.

Jan.'21 – today Deputy Task Force Leader, EUROfusion Work Package "W7-X Exploitation".

Previous positions

Jun.'18 – Feb.'21 Principal Research Scientist (*Investigador Científico*) at LNF.

Oct.'09 – Jun.'18 Permanent Research Scientist (*Científico Titular*) at LNF.

Jun.'06 – Oct.'09 Research Scientist at LNF.

Jan.'19 – Dec.'20 Project Leader, EUROfusion Work Package "Stellarator optimisation: Theory Development, Modelling and Engineering".

Education

Jun.'06 PhD in Physics (*Doctor Europeus*), University of Zaragoza. *Summa cum laude*.

Jun.'02 BSc and MSc in Physics, University of Zaragoza. Highest grade (*Matrícula de Honor*) in all subjects. Grade Point Average: 4.0/4.0. Ranked 1st in Spain.

Honors and awards

2014, 2015 Visiting Scholar and Full Member of the Senior Common Room at Merton College, Oxford, UK.

2013 Young Theoretical Physicist Award, Royal Physical Society of Spain and BBVA Foundation.

2010 Visiting Fellowship, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK.

2008 Member of the Spanish delegation to the *58th Meeting of Nobel Laureates* in Lindau, Germany.

2007 *Premio Extraordinario de Doctorado*, awarded by the University of Zaragoza to the top PhD theses.

2005 Distinguished alumnus, Sagrada Familia School, Zaragoza.

2003 PhD fellowship of the Spanish Ministry of Education.

2003 *Primer Premio Nacional Fin de Carrera de Física*, awarded by the Spanish Ministry of Education to the best graduate in Physics in Spain.

2002 *Premio Extraordinario de Licenciatura en Física*, awarded by the University of Zaragoza to the best graduate in Physics.

2002 *Premio Academia General Militar* to the best graduate in the Faculty of Science at the University of Zaragoza.

1997 *Premio Extraordinario de Bachillerato*, awarded by the Spanish Ministry of Education to the top high-school students.

Research experience

Jun.'19, Apr.'17, Jun.'16	National Institute for Fusion Science, Toki, Japan. Visiting Scientist at the Fusion Theory and Simulation Research Division.
Sep.-Oct. '18, Oct.-Nov. '17, Oct.-Nov. '15, Sep.-Oct. '14	University of Oxford, UK. Visitor at the Rudolf Peierls Centre for Theoretical Physics.
May-Jun. '13 Sep.'12	Massachusetts Institute of Technology, Cambridge, Massachusetts, USA. Visiting Scientist at the Plasma Science and Fusion Center.
Aug.'10	Isaac Newton Institute for Mathematical Sciences, Cambridge, UK. Visiting Fellow.
Jan.-Mar. '09 Jan.-Apr. '08 Feb.-May '07	Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA. Visiting Scientist at the Fusion Energy Division.
Feb.'06	ETH Zürich, Department of Mathematics.
Oct.-Dec. '04 Sep.-Oct. '03	École Normale Supérieure de Lyon, Laboratoire de Physique Théorique, Lyon, France.
Jul.-Sep. '02	Deutsches Elektronen-Synchrotron, Zeuthen (Berlin), Germany. Selected for the Summer Student Programme.

Participation in funded research projects

Deputy Task Force Leader	Work Package "W7-X Exploitation", EUROfusion Consortium. 2021 – today. Approx. 6 M€/year.
Project Leader	Work Package "Stellarator optimisation: Theory Development, Modelling and Engineering", EUROfusion Consortium. 2019 – 2020. Approx. 500 k€/year.
Principal Investigator	PID2021-123175NB-I00, Proyecto de Generación de Conocimiento del Plan Estatal de Investigación Científica, Técnica y de Innovación, Ministerio de Ciencia e Innovación. "Transport simulations in stellarator plasmas and applications to the design of optimized devices", Sep. 2022 – Sep. 2025. 54450 €. PGC2018-095307-B-I00, Proyecto de I+D del Programa Estatal de Generación de Conocimiento y Fortalecimiento Científico y Tecnológico del Sistema de I+D+i, Ministerio de Ciencia, Innovación y Universidades. "Transport in multispecies stellarator plasmas: theory, simulation and experimental validation", 2019–2021. 59290 €. ENE2015-70142-P, Proyecto de I+D del Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia, Ministerio de Economía y Competitividad. "Collisional and turbulent transport in stellarators", 2016–2018. 29645 €. ENE2012-30832, Plan Nacional de I+D+i, Programa Nacional de Proyectos de Investigación Fundamental, Ministerio de Economía y Competitividad. "Kinetic transport theory and simulation of turbulent and non-turbulent fusion plasmas", 2013–2015. 44460 €. ENE2009-07247, Plan Nacional de I+D+i, Programa Nacional de Proyectos de Investigación Fundamental, Ministerio de Ciencia e Innovación. "Influence of global flows and their topology on transport in turbulent plasmas", 2010–2012. 56386 €.

Member of the research team

"Turbulent transport in multi-species stellarator plasmas: theory and simulations", EUROfusion Consortium. Funded by the Euratom Horizon 2020 programme. 2019–2020. PI: José Manuel García-Regaña.

"Propulsión por plasma y fusión nuclear: innovando el transporte espacial", Consejería de Educación e Investigación (Comunidad de Madrid), 2019–2021. PI: Eduardo Ahedo.

Work Package "Preparation and exploitation of W7-X", EUROfusion Consortium. Funded by the Euratom Horizon 2020 programme. Project Leader: Andreas Dinklage.

"Turbulent and neoclassical transport in tokamak plasmas", EUROfusion Consortium. Funded by the Euratom Horizon 2020 programme. 2017–2018. PI: Xavier Garbet.

"Turbulent transport near threshold: experimental and theoretical investigation of the effect of sheared flows and collisions on the ion- and electron-scale turbulence in tokamaks", EUROfusion Consortium. Funded by the Euratom Horizon 2020 programme. 2014. PI: Anthony R. Field.

WP13-IPH-A04-P2-02, "Experimental characterisation and numerical modelling of impurity flow and transport", European Fusion Development Agreement, 2013. Contact Person: Arturo Alonso.

WP13-IPH-A04-P1-01, "Physics of plasma flows and momentum transport in stellarators and tokamaks", European Fusion Development Agreement, 2013. Contact Person: Arturo Alonso.

Grupo Teórico de Altas Energías (Grupo de Excelencia E24/2), Diputación General de Aragón, 2006–2007. PI: Manuel Asorey.

Grupo Teórico de Altas Energías (Grupo Consolidado E24/2), Diputación General de Aragón, 2004–2005. PI: Manuel Asorey.

Grupo Teórico de Altas Energías (Grupo Consolidado), Diputación General de Aragón, 2003–2004. PI: Manuel Asorey.

Red transpirenaica de Teoría cuántica de campos (Barcelona-Montpellier-Zaragoza), CPT-R06/2003, Diputación General de Aragón, 2003-2004. PI: Manuel Asorey.

Programa de cooperación bilateral entre los grupos de Altas Energías de las Universidades de Nápoles y Zaragoza: Fundamental Aspects of Quantum Field Theories, Ministerio de Ciencia y Tecnología, 2001–2006. PI: Manuel Asorey.

FPA 2003-02948, Física cuántica de campos no perturbativa, Ministerio de Educación y Ciencia, 2004–2006. PI: José Luis Cortés.

FPA 2000-1252, Física cuántica de campos no perturbativa, Ministerio de Ciencia y Tecnología, 2001–2003. PI: José Luis Cortés.

Professional and academic service

PhD students

Hanne Thienpondt (co-adv. J. M. García Regaña), 2020 –

Francisco Javier Escoto (co-adv. J. L. Velasco), 2019 –

Antonio González (co-adv. J. M. García Regaña), 2018 –

Pedro Monreal (co-adv. E. Sánchez), Universidad Complutense de Madrid, July 2017. Grade: *Summa cum laude*.

MSc students

José Ángel Capitán (co-adv. J. M. García Regaña), Máster Interuniversitario en Física Nuclear, Universidad Autónoma de Madrid, July 2023. Grade: 10/10.

Hanne Thienpondt (co-adv. J. M. García Regaña), European Master of Science in Nuclear Fusion and Engineering Physics, July 2020. Grade: Great Distinction.

Luis Martín (co-adv. J. L. Velasco), Máster Interuniversitario en Física Nuclear, Universidad Complutense de Madrid, September 2019. Grade: 9/10.

Neil Lamas (co-adv. J. L. Velasco), European Master of Science in Nuclear Fusion and Engineering Physics, July 2019. Grade: Great Distinction.

Organizer of the *Simons-CIEMAT Joint Meeting on Stellarator Turbulence Optimization*, 2023.

Organizer of the *Kinetic Theory Working Group Meeting* in Madrid (2012, 2014, 2016, 2018).

Member (as the representative of Work Package S2) of the Scientific Board of the EUROfusion - Theory and Advanced Simulation Coordination, 2019–2020.

Member of the Scientific Committee of the Joint Varenna-Lausanne International Workshop on the Theory of Fusion Plasmas (2023 – today).

Member of the Programme Committee of the 28th IAEA Fusion Energy Conference (2021).

Member of the Programme Committee of the 48th EPS Conference on Plasma Physics (2022).

Member of the Programme Committee of the European Fusion Theory Conference (2015–2021).

Reviewer for the *Agencia Nacional de Evaluación y Prospectiva* of Spain.

Referee for EUROfusion Enabling Research projects, Euratom Horizon 2020 programme.

Referee for Physical Review Letters, Nuclear Fusion, Plasma Physics and Controlled Fusion, Physics of Plasmas, Journal of Plasma Physics, Reports on Progress in Physics, Europhysics Letters, Journal of Physics A: Mathematical and Theoretical.

Languages

Spanish	Native
English	Fluent
French	Intermediate
German	Beginner

Research papers

[95]. "MONKES: a fast neoclassical code for the evaluation of monoenergetic transport coefficients". F. J. Escoto, J. L. Velasco, I. Calvo, M. Landreman, F. I. Parra.

[94]. "Electrostatic microturbulence in W7-X: comparison of local gyrokinetic simulations with Doppler reflectometry measurements". A. González-Jerez, J. M. García-Regaña, I. Calvo, D. Carralero, T. Estrada, E. Sánchez, M. Barnes and the W7-X Team.

[93]. "Reduction (or enhancement) of stellarator turbulence by impurities". J. M. García-Regaña, I. Calvo, F. I. Parra, H. Thienpondt. Available at arXiv:2305.16805.

[92]. "Robust stellarator optimization via flat mirror magnetic fields". J. L. Velasco, I. Calvo, E. Sánchez, F. I. Parra. *Nuclear Fusion* 63, 126038 (2023).

[91]. "Prevention of core particle depletion in stellarators by turbulence". H. Thienpondt, J. M. García-Regaña, I. Calvo, J. A. Alonso, J. L. Velasco, A. González-Jerez, M. Barnes, K. Brunner, O. Ford, G. Fuchert, J. Knauer, E. Pasch, L. Vanó and the Wendelstein 7-X team. *Physical Review Research* 5, L022053 (2023).

[90]. "A quasi-isodynamic configuration with good confinement of fast ions at low plasma β". E. Sánchez, J. L. Velasco, I. Calvo, S. Mulas. *Nuclear Fusion* 63, 066037 (2023).

[89]. "Neoclassical transport in strong gradient regions of large aspect ratio tokamaks". Silvia Trinczek, Félix I. Parra, Peter J. Catto, Iván Calvo, Matt Landreman. *Journal of Plasma Physics* 89, 905890304 (2023).

[88]. "Finite orbit width effects in large aspect ratio stellarators". Vincent d'Herbemont, Félix I. Parra, Iván Calvo, José Luis Velasco. *Journal of Plasma Physics* 88, 905880507 (2022).

[87]. "ASCOT5 simulations of neutral beam heating and current drive in the TJ-II stellarator". S. Mulas, Á. Cappa, J. Kontula, D. López-Bruna, I. Calvo, F. I. Parra, M. Liniers, T. Kurki-Suonio, M. Mantsinen. *Nuclear Fusion* 62, 106008 (2022).

[86]. "Plasma flow measurements based on charge exchange recombination spectroscopy in the Wendelstein 7-X stellarator". J A. Alonso, O. P. Ford, L. Vanó, S. Äkäslompolo, S. Buller, R. McDermott, H. M. Smith, J. Baldzuhn, C. D. Beidler, M. Beurskens, S. Bozhenkov, K. J. Brunner, I. Calvo, D. Carralero, A. Dinklage, T. Estrada, G. Fuchert, J. Geiger, J. Knauer, A. Langenberg, N. A. Pablant, E. Pasch, P. Zs. Poloskei, J. L. Velasco, T. Windisch and the W7-X Team. *Nuclear Fusion* 62, 106005 (2022).

[85]. "Physics design point of high-field stellarator reactors". J. A. Alonso , I. Calvo , D. Carralero , J. L. Velasco, J. M. García-Regaña , I. Palermo, D. Rapisarda. *Nuclear Fusion* 62, 036024 (2022).

[84]. "On the role of density fluctuations in the core turbulent transport of Wendelstein 7-X". D. Carralero *et al. Plasma Physics and Controlled Fusion* 64, 044006 (2022).

[83]. "EUROfusion-Theory and Advanced Simulation Coordination (E-TASC): programme and the role of high performance computing". X. Litaudon *et al. Plasma Physics and Controlled Fusion* 64, 034005 (2022).

[82]. "Electrostatic gyrokinetic simulations in Wendelstein 7-X geometry: benchmark between the codes stella and GENE". A. González-Jerez, P. Xanthopoulos, J. M. García-Regaña, I. Calvo, J. Alcusón, A. Bañón-Navarro, M. Barnes, F. I. Parra, J. Geiger. *Journal of Plasma Physics* 88, 905880310 (2022).

[81]. "A model for the fast evaluation of prompt losses of energetic ions in stellarators". J. L. Velasco, I. Calvo, S. Mulas, E. Sánchez, F. I. Parra, Á. Cappa and the W7-X team. *Nuclear Fusion* 61, 116059 (2021).

[80]. "An experimental characterization of core turbulence regimes in Wendelstein 7-X". D. Carralero, T. Estrada, E. Maragkoudakis, T. Windisch, J. A. Alonso, M. Beurskens, S. Bozhenkov, I. Calvo, H. Damm, O. Ford, G. Fuchert, J. M. García-Regaña, N. Pablant, E. Sánchez, E. Pasch, J. L. Velasco and the Wendelstein 7-X team. *Nuclear Fusion* 61, 096015 (2021).

[79]. "Ion temperature clamping in Wendelstein 7-X Electron Cyclotron Heated plasmas". M. N. A. Beurskens, S. A. Bozhenkov, O. Ford, P. Xanthopoulos, Y. Turkin, A. Alonso, C. Beidler, I. Calvo, D. Carralero, T. Estrada, G. Fuchert, O. Grulke, M. Hirsch, K. Ida, M. Jakubowski, C. Killer, M. Krychowiak, S. Kwak, S. Lazerson, A. Langenberg, R. Lunsford, N. Pablant, E. Pasch, A. Pavone, F. Reimold, Th. Romba, A. von Stechow, H. M. Smith, T. Windisch, M.

Yoshinuma, D. Zhang, R. Wolf and the Wendelstein 7-X team. *Nuclear Fusion* 61, 116072 (2021).

[78]. "Fast simulations for large aspect ratio stellarators with the neoclassical code KNOSOS". J. L. Velasco, I. Calvo, F. I. Parra, V. d'Herbemont, H. M. Smith, D. Carralero, T. Estrada and the W7-X team. *Nuclear Fusion* 61, 116013 (2021).

[77]. "Turbulent transport of impurities in 3D devices". J. M. García-Regaña, M. Barnes, I. Calvo, A. González-Jerez, H. Thienpondt, E. Sánchez, F. I. Parra and D. St.-Onge. *Nuclear Fusion* 61, 116019 (2021).

[76]. "Gyrokinetic simulations in stellarators using different computational domains". E. Sánchez, J. M. García-Regaña, A. Bañón Navarro, J. H. E. Proll, C. Mora Moreno, A. González-Jerez, I. Calvo, R. Kleiber, J. Riemann, J. Smoniewski, M. Barnes and F. I. Parra. *Nuclear Fusion* 61, 116074 (2021).

[75]. "Overview of the TJ-II stellarator research programme towards model validation in fusion plasmas". C. Hidalgo *et al. Nuclear Fusion* 62, 042025 (2022).

[74]. "Experimental confirmation of efficient island divertor operation and successful neoclassical transport optimization in Wendelstein 7-X". T. Sunn Pedersen *et al. Nuclear Fusion* 62, 042022 (2022).

[73]. "Study on impurity hole plasmas by global simulation". K. Fujita, S. Satake, M. Nunami, J. M. García-Regaña, J. L. Velasco and I. Calvo. *Nuclear Fusion* 61, 086025 (2021).

[72]. "Turbulent impurity transport simulations in Wendelstein 7-X plasmas". J. M. García-Regaña, M. Barnes, I. Calvo, F. I. Parra, J. Alcusón, R. Davies, A. González-Jerez, A. Mollén, E. Sánchez, J. L. Velasco and A. Zocco. *Journal of Plasma Physics* 87, 855870103 (2021).

[71]. "Comparison of local and global gyrokinetic calculations of collisionless zonal flow damping in quasi-symmetric stellarators". J. Smoniewski, J. N. Talmadge, E. Sánchez and I. Calvo. *Physics of Plasmas* 28, 042503 (2021).

[70]. "KNOSOS: A fast orbit-averaging neoclassical code for stellarator geometry". J. L. Velasco, I. Calvo, F. I. Parra and J. M. García-Regaña. *Journal of Computational Physics* 418, 109512 (2020).

[69]. "Global calculation of neoclassical impurity transport including the variation of electrostatic potential". K. Fujita, S. Satake, R. Kanno, M. Nunami, M. Nakata, J. M. García-Regaña, J. L. Velasco, I. Calvo. *Journal of Plasma Physics* 86, 905860319 (2020).

[68]. "Impact of main ion pressure anisotropy on stellarator impurity transport". Iván Calvo, Félix I. Parra, J. L. Velasco, J. M. García-Regaña. *Nuclear Fusion* 60, 016035 (2020).

[67]. "Overview of the JET preparation for deuterium-tritium operation with the ITER like-wall". E. Joffrin *et al. Nuclear Fusion* 59, 112021 (2019).

[66]. "Overview of recent TJ-II stellarator results". E. Ascasíbar *et al. Nuclear Fusion* 59, 112019 (2019).

[65]. "Overview of first Wendelstein 7-X high-performance operation". T. Klinger *et al. Nuclear Fusion* 59, 112004 (2019).

[64]. "Validation of global gyrokinetic simulations in stellarator configurations". E. Sánchez, T. Estrada, J. L. Velasco, I. Calvo, A. Cappa, A. Alonso, J. M. García-Regaña, R. Kleiber, J. Riemann and the TJ-II team. *Nuclear Fusion* 59, 076029 (2019).

[63]. "Turbulence and perpendicular plasma flow asymmetries measured at TJ-II plasmas". T. Estrada, E. Sánchez, J. M. García-Regaña, J. A. Alonso, E. Ascasíbar, I. Calvo, A. Cappa, D. Carralero, C. Hidalgo, M. Liniers, I. Pastor, J. L. Velasco and the TJ-II team. *Nuclear Fusion* 59, 076021 (2019).

[62]. "Stellarator impurity flux driven by electric fields tangent to magnetic surfaces". Iván Calvo, Félix I. Parra, J. L. Velasco, J. Arturo Alonso and J. M. García-Regaña. *Nuclear Fusion* 58,

124005 (2018).

[61]. "Electrostatic potential variations on stellarator magnetic surfaces in low collisionality regimes". Iván Calvo, José Luis Velasco, Félix I. Parra, J. Arturo Alonso and José Manuel García-Regaña. *Journal of Plasma Physics* 84, 905840407 (2018).

[60]. "On-surface potential and radial electric field variations in electron root stellarator plasmas". J. M. García-Regaña, T. Estrada, I. Calvo, J. L. Velasco, J. A. Alonso, D. Carralero, R. Kleiber, M. Landreman, A. Mollén, E. Sánchez, C. Slaby, TJ-II Team and W7-X Team. *Plasma Physics and Controlled Fusion* 60, 104002 (2018).

[59]. "Oscillatory relaxation of zonal flows in a multi-species stellarator plasma". E. Sánchez, I. Calvo, J. L. Velasco, F. Medina, A. Alonso, P. Monreal, R. Kleiber and the TJ-II team. *Plasma Physics and Controlled Fusion* 60, 094003 (2018).

[58]. "Large tangential electric fields in plasmas close to temperature screening". J. L. Velasco, I. Calvo, J. M. García-Regaña, F. I. Parra, S. Satake, J. A. Alonso and the LHD team. *Plasma Physics and Controlled Fusion* 60, 074004 (2018).

[57]. "Overview of the JET results in support to ITER". X. Litaudon *et al*. *Nuclear Fusion* 57, 102001 (2017).

[56]. "Major results from the first plasma campaign of the Wendelstein 7-X stellarator". R. C. Wolf *et al*. *Nuclear Fusion* 57, 102020 (2017).

[55]. "3D effects on transport and plasma control in the TJ-II stellarator". F. Castejón *et al*. *Nuclear Fusion* 57, 102022 (2017).

[54]. "Semianalytical calculation of the zonal-flow oscillation frequency in stellarators". P. Monreal, E. Sánchez, I. Calvo, A. Bustos, F. I. Parra, A. Mishchenko, A. Könies and R. Kleiber. *Plasma Physics and Controlled Fusion* 59, 065005 (2017).

[53]. "Observation of oscillatory radial electric field relaxation in a helical plasma". J. A. Alonso, E. Sánchez, I. Calvo, J. L. Velasco, K. J. McCarthy, A. Chmyga, L. G. Eliseev, T. Estrada, R. Kleiber, L. I. Krupnik, A. V. Melnikov, P. Monreal, F. I. Parra, S. Perfilov, A. I. Zhezhera and the TJ-II Team. *Physical Review Letters* 118, 185002 (2017).

[52]. "The effect of tangential drifts on neoclassical transport in stellarators close to omnigeneity". Iván Calvo, Felix I. Parra, J. L. Velasco and J. A. Alonso. *Plasma Phys. Control. Fusion* 59, 055014 (2017).

[51]. "Moderation of neoclassical impurity accumulation in high temperature plasmas of helical devices". J. L. Velasco, I. Calvo, S. Satake, A. Alonso, M. Nunami, M. Yokoyama, M. Sato, T. Estrada, J. M. Fontdecaba, M. Liniers, K. J. McCarthy, F. Medina, B. Ph. van Milligen, M. Ochando, F. Parra, H. Sugama, A. Zhezhera, the LHD experimental team and the TJ-II team. *Nuclear Fusion* 57, 016016 (2017).

[50]. "Particle transport after pellet injection in the TJ-II stellarator". J. L. Velasco, K. J. McCarthy, N. Panadero, S. Satake, D. López-Bruna, A. Alonso, I. Calvo, A. Dinklage, T. Estrada, J. M. Fontdecaba, J. Hernández, R. García, F. Medina, M. Ochando, I. Pastor, S. Perfilov, E. Sánchez, A. Soleto, B. Ph. van Milligen, A. Zhezera, the HIBP team, and the TJ-II team. *Plasma Physics and Controlled Fusion* 58, 084004 (2016).

[49]. "Parallel impurity dynamics in the TJ-II stellarator". J. Arturo Alonso, Iván Calvo, Teresa Estrada, Josep M. Fontdecaba, José Manuel García-Regaña, Joachim Geiger, Matt Landreman, Kieran McCarthy, Francisco Medina, Boudewijn Van Milligen, María A. Ochando, Felix I. Parra, and José Luis Velasco. *Plasma Physics and Controlled Fusion* 58, 074009 (2016).

[48]. "Residual zonal flows in tokamaks and stellarators at arbitrary wavelengths". P. Monreal, I. Calvo, E. Sánchez, F. I. Parra, A. Bustos, A. Könies, R. Kleiber, and T. Görler. *Plasma Physics and Controlled Fusion* 58, 045018 (2016).

[47]. "Radial transport of toroidal angular momentum in tokamaks". Iván Calvo and Felix I. Parra.

Plasma Physics and Controlled Fusion 57, 075006 (2015).

[46]. "Electrostatic potential variations along flux surfaces in stellarators". M. A. Pedrosa, J. A. Alonso, J. M. García-Regaña, C. Hidalgo, J. L. Velasco, I. Calvo, C. Silva, and P. Helander. *Nuclear Fusion* 55, 052001 (2015).

[45]. "Less constrained omnigenous stellarators". Felix I. Parra, Iván Calvo, Per Helander, and Matt Landreman. *Nuclear Fusion* 55, 033005 (2015).

[44]. "Flow damping in stellarators close to quasisymmetry". Iván Calvo, Felix I. Parra, J. L. Velasco, and J. Arturo Alonso. *Plasma Physics and Controlled Fusion* 57, 014014 (2015).

[43]. "Transport, stability and plasma control studies in the TJ-II stellarator". J. Sánchez *et al*. *Nuclear Fusion* 55, 104014 (2015).

[42]. "Equivalence of two independent calculations of the higher order guiding center Lagrangian". F. I. Parra, I. Calvo, J. W. Burby, J. Squire, and H. Qin. *Physics of Plasmas* 21, 104506 (2014).

[41]. "Optimizing stellarators for large flows". Iván Calvo, Felix I. Parra, J. Arturo Alonso, and José Luis Velasco. *Plasma Physics and Controlled Fusion* 56, 094003 (2014).

[40]. "Dynamics of flows and confinement in the TJ-II stellarator". J. Sánchez *et al*. *Nuclear Fusion* 53, 104016 (2013).

[39]. "Stellarators close to quasisymmetry". Iván Calvo, Felix I. Parra, J. L. Velasco, and J. Arturo Alonso. *Plasma Physics and Controlled Fusion* 55, 125014 (2013).

[38]. "Damping of radial electric field fluctuations in the TJ-II stellarator". J. L. Velasco, J. A. Alonso, I. Calvo, J. Arévalo, E. Sánchez, L. Eliseev, S. Perfilov, T. Estrada, A. López-Fraguas, C. Hidalgo, and the TJ-II team. *Plasma Physics and Controlled Fusion* 55, 124044 (2013).

[37]. "Collisionless damping of flows in the TJ-II stellarator". Edilberto Sánchez, Ralf Kleiber, Roman Hatzky, Matthias Borchardt, Pedro Monreal, Francisco Castejón, Antonio López-Fraguas, Xavier Sáez, José Luis Velasco, Iván Calvo, Arturo Alonso, and Daniel López-Bruna. *Plasma Physics and Controlled Fusion* 55, 014015 (2013).

[36]. "Long-wavelength limit of gyrokinetics in a turbulent tokamak and its intrinsic ambipolarity". Iván Calvo and Félix I. Parra. *Plasma Physics and Controlled Fusion* 54, 115007 (2012).

[35]. "Vanishing neoclassical viscosity and physics of the shear layer in stellarators". J. L. Velasco, J. A. Alonso, I. Calvo, and J. Arévalo. *Physical Review Letters* 109, 135003 (2012).

[34]. "Extreme-value distributions and renormalization group". Iván Calvo, Juan C. Cuchí, J. G. Esteve, and Fernando Falceto. *Physical Review E* 86, 041109 (2012).

[33]. "Shear-flow susceptibility near the low density transition in TJ-II". D. Carralero, I. Calvo, S. da Graça, B. A. Carreras, T. Estrada, M. A. Pedrosa, and C. Hidalgo. *Plasma Physics and Controlled Fusion* 54, 065006 (2012).

[32]. "Intrinsic rotation with gyrokinetic models". Felix I. Parra, Michael Barnes, Iván Calvo, and Peter J. Catto. *Physics of Plasmas* 19, 056116 (2012).

[31]. "Overview of TJ-II experiments". J. Sánchez *et al*. *Nuclear Fusion* 51, 094022 (2011).

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Invited talks, oral contributions and seminars

[34]. 29th IAEA Fusion Energy Conference. *A quasi-isodynamic stellarator configuration optimized for fast-ion confinement and turbulent transport*. London, UK, October 16–21, 2023.

[33]. 20th European Fusion Theory Conference. *Orbit-averaged approach to fast-ion transport in stellarators*. Padova, Italy, October 2–5, 2023.

[32]. Seminar at the Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México. *Neoclassical transport in low-collisionality stellarator plasmas*, June 30, 2021.

[31]. Chalmers University of Technology, Gothenburg, Sweden. Workshop on Transport and Instabilities in Magnetized Plasmas. *Stellarator impurity transport driven by main ion pressure anisotropy*, September 12, 2019.

[30]. Seminar at the National Institute for Fusion Science, Toki, Japan. *Impact of main ion pressure anisotropy on stellarator impurity transport*, June 19, 2019.

[29]. 19th Coordinated Working Group Meeting. *Impact of main ion pressure anisotropy on stellarator impurity transport*. Berlin, Germany, March 12–14, 2019.

[28]. 23rd Joint EU-US Transport Task Force Meeting. *Neoclassical stellarator impurity flux driven by electrostatic potential variations on magnetic surfaces*. Seville, Spain, September 11–14, 2018.

[27]. Seminar at the Oxford Plasma Theory Group Meeting, University of Oxford, UK. *Some recent advances on the theory and modelling of stellarator neoclassical transport*, October 4, 2018.

[26]. Wendelstein Seminar at the Max Planck Institute for Plasma Physics, Greifswald, Germany. *Some recent advances on the theory and modelling of stellarator neoclassical transport*, August 29, 2018.

[25]. 18th Coordinated Working Group Meeting. *Neoclassical impurity flux in stellarators driven by electrostatic potential variations on the magnetic surface*. Princeton, USA, April 10–12, 2018.

[24]. Wolfgang Pauli Institute, Vienna, Austria. *Neoclassical calculation of the tangential electric field in stellarators close to omnigeneity (and tokamaks with broken symmetry)*, July 17, 2017.

[23]. Wolfgang Pauli Institute, Vienna, Austria. *The effect of tangential drifts on neoclassical transport in stellarators close to omnigeneity*, July 27, 2016.

[22]. Seminar at the National Institute for Fusion Science, Toki, Japan. *Low collisionality neoclassical transport in stellarators close to omnigeneity: the role of tangential drifts*, June 17, 2016.

[21]. 16th European Fusion Theory Conference. *Quasisymmetry far from the magnetic axis*. Lisbon, Portugal, October 5–8, 2015.

[20]. Gyrokinetic Theory Working Group Meeting. *Optimizing stellarators for large flows*. Madrid, Spain, June 30 – July 11, 2014.

[19]. 41st EPS Conference on Plasma Physics. *Optimizing stellarators for large flows*. Berlin, Germany, June 23–27, 2014.

[18]. 19th International Stellarator and Heliotron Workshop. *Calculating the radial electric field in quasisymmetric stellarators*. Padova, Italy, September 16–20, 2013.

[17]. Wolfgang Pauli Institute, Vienna, Austria. *Violation of ambipolarity due to a small deviation from quasisymmetry*, March 27, 2013.

[16]. Gyrokinetic Theory Working Group Meeting. *A formulation of electromagnetic gyrokinetics covering from microturbulence to MHD-turbulence scales*. Madrid, Spain, June 18–29, 2012.

[15]. Wolfgang Pauli Institute, Vienna, Austria. *A full-f approach to second-order electromagnetic gyrokinetics*, March 27, 2012.

[14]. Wolfgang Pauli Institute, Vienna, Austria. *Second-order gyrokinetics at long wavelengths: the tokamak radial electric field*, April 14, 2011.

[13]. Seminar at Universidad Complutense de Madrid. *Adiabatic invariants and kinetic equations for fusion plasma turbulence*, February 25, 2011.

[12]. V National Conference BIFI 2011. *Adiabatic invariants and kinetic equations for fusion plasma turbulence*, February 2–4, 2011.

[11]. Seminar at University of Zaragoza, Department of Theoretical Physics. *Adiabatic invariants and kinetic equations for fusion plasma turbulence*, November 19, 2010.

[10]. Isaac Newton Institute for Mathematical Sciences, Cambridge, U.K. *Lagrangian formulation of gyrokinetic theory with a single expansion parameter*, August 10, 2010.

[9]. Seminar at University of Zaragoza, Department of Theoretical Physics. *Turbulent toroidal plasmas, flow topology and anomalous transport*, October 30, 2009.

[8]. 13th European Fusion Theory Conference. *Topological characterization of flows in plasma turbulence: the impact of topology on transport*. Riga, Latvia, October 12–15, 2009.

[7]. XXXII Bienal de Física. *Topology of flows in turbulent toroidal plasmas and its impact on transport*. Ciudad Real, Spain, September 7–11, 2009.

[6]. Seminar at University of Zaragoza, Department of Theoretical Physics. *Fenómenos de transporte sin escalas características y ecuaciones de difusión fraccionarias: generalización fraccionaria de la Ley de Fick*, June 20, 2008.

[5]. Seminar at Laboratorio Nacional de Fusión, Asociación EURATOM-CIEMAT. *Fractional generalization of Fick's law: a microscopic approach through Continuous Time Random Walks*. Madrid, June 1, 2007.

[4]. Seminar at Laboratorio Nacional de Fusión, Asociación EURATOM-CIEMAT. *Deformation quantization and the Poisson sigma model*. Madrid, February 2006.

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[2]. Campus de Excelencia 05. *Poisson-Sigma models*. Canary Islands, Spain, June 10–16, 2005.

[1]. Seminar at École Normale Supérieure de Lyon, Laboratoire de Physique Théorique, December 2004.

Other conference contributions

[65]. *Robust stellarator optimization via flat mirror magnetic fields.* J. L. Velasco, I. Calvo, E. Sánchez, F. I. Parra. 20th European Fusion Theory Conference. Padova, Italy, October 2–5, 2023.

[64]. *Fast evaluation of the bootstrap current in stellarators.* F. J. Escoto , J. L. Velasco , I. Calvo, M. Landreman, F. I. Parra. 20th European Fusion Theory Conference. Padova, Italy, October 2–5, 2023.

[63]. *Linear equations for stellarator local MHD equilibria in irrational and rational flux surfaces.* Félix I. Parra, Iván Calvo, Wrick Sengupta, José Manuel García-Regaña, Antonio González-Jerez. 64th Annual Meeting of the APS Division of Plasma Physics. Spokane, Washington, USA, October 17–21, 2022.

[62]. *Neoclassical Transport in strong gradient regions of large aspect ratio tokamaks.* Silvia Trinczek, Félix I. Parra, Peter J. Catto, Iván Calvo, Matt Landreman. 64th Annual Meeting of the APS Division of Plasma Physics. Spokane, Washington, USA, October 17–21, 2022.

[61]. *Stabilisation of electrostatic electron- temperature-gradient instability in stellarators*. J. F. Parisi, F. I. Parra, M. Barnes, J. M. García-Regaña, I. Calvo, M. R. Hardman, T. Qian, D. St-Onge, G. Walkowski. 64th Annual Meeting of the APS Division of Plasma Physics. Spokane, Washington, USA, October 17–21, 2022.

[60]. *Finite orbit width effects in large aspect ratio stellarators.* Félix I. Parra, Vincent d'Herbemont, Iván Calvo, José Luis Velasco. Sherwood Fusion Theory Conference. Santa Rosa, California, USA, April 4–6, 2022.

[59]. *Finite orbit width effects on neoclassical transport in large aspect ratio tokamaks.* S. Trinczek, F. I. Parra, P. J. Catto, I. Calvo, M. Landreman. Sherwood Fusion Theory Conference. Santa Rosa, California, USA, April 4–6, 2022.

[58]. *From present-day stellarators to a demonstration reactor: sizing and plasma physics regimes of intermediate devices.* J. A. Alonso, I. Calvo, D. Carralero, A. Dinklage, J. M. García-Regaña, T. S. Pedersen, J. de la Riva, J. L. Velasco. 23rd International Stellarator-Heliotron Workshop. Warsaw, Poland, June 20–24, 2022.

[57]. *Towards a fast and accurate calculation of the bootstrap current in low collisionality stellarator plasmas.* F. J. Escoto, J. L. Velasco, I. Calvo, F. I. Parra. 23rd International Stellarator-Heliotron Workshop. Warsaw, Poland, June 20–24, 2022.

[56]. *Study of turbulent fluctuations in Wendelstein 7-X with gyrokinetic simulations and Doppler Reflectometry.* A. González-Jerez, J. M. García-Regaña, I. Calvo, D. Carralero, T. Estrada, E. Sánchez, M. Barnes. 23rd International Stellarator-Heliotron Workshop. Warsaw, Poland, June 20–24, 2022.

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[52]. *Turbulent transport of impurities in 3D devices.* J. M. García-Regaña, M. Barnes, I. Calvo, A. González-Jerez, F. I. Parra, E. Sánchez, D.-St. Onge, H. Thienpondt, the W7-X Team and the TJ-II Team. 28th IAEA Fusion Energy Conference. Virtual Event, May 10–15, 2021.

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[46]. *Turbulence and radial electric field asymmetries measured at TJ-II plasmas.* T. Estrada, E. Sánchez, J. M. García-Regaña, J. A. Alonso, E. Ascasíbar, I. Calvo, A. Cappa, D. Carralero, C. Hidalgo, M. Liniers, I. Pastor, J. L. Velasco and the TJ-II Team. 27th IAEA Fusion Energy Conference. Gandhinagar, India, October 22–27, 2018.

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[40]. *Influence of poloidal drifts on neoclassical transport in optimized stellarators.* Iván Calvo, Félix I. Parra, José Luis Velasco, and J. Arturo Alonso. 43th EPS Conference on Plasma Physics. Leuven, Belgium, July 4–8, 2016.

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[36]. *Intrinsic rotation in tokamaks.* F. I. Parra, M. Barnes, and I. Calvo. 2014 Transport Task Force Meeting. Culham Centre for Fusion Energy, United Kingdom, September 8–11, 2014.

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[32]. *Impurity density asymmetries in TJ-II model and first comparisons.* J. A. Alonso, J. Arévalo, J L. Velasco, I. Calvo, M. A. Ochando, J. M. García-Regaña, and M. Landreman. 19th International Stellarator and Heliotron Workshop. Padova, Italy, September 16–20, 2013.

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[23]. *Reynolds stress generation of poloidally asymmetric zonal flows and long-range correlations in fusion plasmas*, I. Calvo, B. A. Carreras, L. García, M. A. Pedrosa, and C. Hidalgo. 37th European Physical Society Conference on Plasma Physics. Dublin, Ireland, June 21–25, 2010.

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[15]. *Pseudochaotic poloidal transport in toroidal geometry: pressure gradient driven turbulence and plasma flow topology*. I. Calvo, L. García, B. A. Carreras, R. Sánchez, and B. Ph. van Milligen. 35th EPS Plasma Physics Conference. Hersonissos, Crete, Greece, June 9–13, 2008.

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