Curriculum Vitae: Alberto Mariani

PERSONAL DATA

Born in Milan, July 15 1983
Resident in Via Giosuè Carducci 12, 20841 Carate Brianza (MB), Italy
Italian nationality

RESEARCH ACTIVITY

From 02/11/2022 **Istituto per la Scienza e Tecnologia dei Plasmi (ISTP)-CNR, Milano**

- Researcher.

01/01/2021 to 01/11/2022 **Università degli Studi di Milano Bicocca**

- Researcher (Fixed-time researcher of type A: RTDA): winner of Bando Cod. 2020-RTDA-040 (D.R. n. rep. 4432/2020, Prot. 45858/20 del 24.07.2020, Avviso pubblicato sulla Gazzetta Ufficiale – 4a Serie Speciale - Concorsi ed Esami n. 57 del 24.07.2020; Settore concorsuale 02/B1 – Fisica Sperimentale della Materia; Settore scientifico-disciplinare FIS/03 – Fisica della Materia).

2019-31/12/2020 **Istituto per la Scienza e Tecnologia dei Plasmi (ISTP)-CNR, Milano**

- Post-Doc (assegno di ricerca) on Plasma Physics

1/09/2017-2019 **Istituto di Fisica del Plasma (IFP)-CNR, Milano**

- Post-Doc (assegno di ricerca) on Plasma Physics

1/09/2014-31/08/2017 **Swiss Plasma Center (SPC), EPFL, Lausanne (CH)**

- Post-Doc on Plasma Physics

SHORT DESCRIPTION OF THE RESEARCH ACTIVITY:
The research activity carried out by A. Mariani lies within the frame of thermonuclear fusion research in tokamaks, principally focusing on the experimental investigation of core transport and theoretical/numerical modelling of experimental results. As side activities, it also deals with the numerical modelling of Electron Cyclotron Resonance Heating (ECRH) and the theoretical description of magnetohydrodynamic (MHD) instabilities. After working on ECRH theory and modeling during the PhD, A. Mariani dedicated to the theoretical modelling and numerical simulation of turbulent particle, heat and momentum transport in tokamaks, by performing gyrokinetic simulations. Within this framework, A. Mariani collaborated with several EU tokamak groups, including TCV (Lausanne, CH), JET (Culham, UK), AUG (Garching, DE), regularly participating from 2017/2018 to the EUROfusion WP MST1 and JET1 experimental campaigns. In particular, during the years, he investigated various topics, such as the validation of quasilinear models for the evaluation of turbulent fluxes with nonlinear gyrokinetic results, considering different levels of physical details, the study of Electron Temperature Gradient (ETG)-driven micro-turbulence on electron heat transport in TCV, AUG and JET, with particular attention at the multi-scale properties of the transport, the study of

density peaking in TCV and JET, with particular interest on the role of particle fuelling in JET cases with NBI and on the analysis of finite Larmor radius effects ('global effects') on density peaking in TCV. Moreover, he also worked on evaluating the impact of isotope mass, electromagnetic effects, fast ions produced by ICRH and NBI, collisions and impurities on heat transport for JET plasmas. On the ECRH side, he studied the impact of finite Gaussian beam spectrum on EC resonance with applications to the ITER EC Upper Launcher and the correct formal theory of the wave energy flux of high frequency diffracting beams in complex geometrical optics. Finally, on the MHD side, he worked in particular on the excitation mechanism for low-n edge infernal-like modes in quiescent H-mode regimes, of interest for the understanding of the Edge Harmonic Oscillations (EHO) in Edge Localized Mode (ELM)-Free, high performance, tokamak plasmas.

TEACHING EXPERIENCE

2021-present Università degli Studi di Milano-Bicocca

- Assistant of the course: 'Fisica I', taught by Prof. M. Paganoni at the Bachelor's level.

2019 Università degli Studi di Milano-Bicocca

- Teacher of the course 'Advanced Plasma Physics' (2 CFU, 16 hours) at the PhD level.

2017-present Università degli Studi di Milano-Bicocca

- Assistant of the course: 'Fisica II', taught by Prof. G. Gorini at the Bachelor's level.

2015-2017 Ecole Polytechnique Fédérale de Lausanne (EPFL, CH)

- Principal assistant of the course 'Mathematical methods for physicists' taught by Prof. S. Brunner and Prof. J. Graves at the Bachelor's level.

SCIENTIFIC EXPERIENCE

2014-present High Performance Computing

- 2022-2023: MARCONI-CINECA cluster (Bologna, IT): Principle Investigator of the computational projects FUA36_GTAPES (14.8M CPU hours) and FUA36_MULTAUG3 (9.1M CPU hours), under the MARCONI Project cycle 6, regarding gyrokinetic simulations of turbulent transport in tokamaks; JFRS-1 cluster (IFERC, Rokkasho Fusion Institute, National Institutes for Quantum and Radiological Science and Technology, Japan): Principle Investigator of the computational project GGMTAP (27.9M CPU hours).

- 2021-2022: MARCONI-CINECA cluster (Bologna, IT): Principle Investigator of the computational project FUA35_MULTAUG2, under the MARCONI Project cycle 5 (2.4M CPU hours), regarding gyrokinetic simulations of turbulent transport in tokamaks;

- 2020-2021: MARCONI-CINECA cluster (Bologna, IT): Principle Investigator of the computational project FUA34_MULTAUG, under the MARCONI Project cycle 4 (19.2M CPU hours), regarding gyrokinetic simulations of turbulent transport in tokamaks;

- 2014-present: Collaborator of several computational projects on different supercomputers: HELIOS (JP), CSCS (CH), MARCONI-CINECA (IT), about gyrokinetic simulations of heat, particle and momentum transport in Fusion-relevant plasmas.

2021-present **Partecipation to EUROfusion Theory, Simulation, Validation and Verification" (TSVV) Tasks**

- 2021-2022: participation to TSVV Task 2 (Physics Properties of Strongly shaped configurations): 0.36 ppy, regarding gyrokinetic simulations of turbulent transport in DTT possible scenarios with negative triangularity;

2021-present **Divertor Tokamak Test (DTT) scientific design**

- 2021: 0.4 ppy, regarding gyrokinetic simulations of turbulent transport;

2018-present **Joint European Torus (JET), Culham (UK)**

- 2022: 35 working days off site for EUROfusion JET C40 and C41 2022 experimental campaigns (Experiments and tasks: JET-M18-22, JET-M18-24, JET-M21-07);
- 2021: 35 working days off site for EUROfusion WP JET1 2021 experimental campaign (Experiments and tasks: JET-M18-22, JET-M18-24, JET-T18-03);
- 2020: 110 working days off site for EUROfusion WP JET1 2020 experimental campaign (Experiments and tasks: JET-B18-07, JET-M18-19, JET-M18-22, JET-M18-24, JET-M18-12, JET-T18-03);
- 2019: 24 working days on site and 70 working days off site for EUROfusion WP JET1 2019 experimental campaign (Experiments and tasks: JET-B18-07, JET-M18-19, JET-M18-22, JET-M18-24, JET-T18-03);
- 2018: 25 working days on site and 75 working days off site for EUROfusion WP JET1 2018 experimental campaign (Experiments and tasks: JET-B18-07, JET-M18-19, JET-M18-22, JET-M18-24, JET-T18-03).

2017-2019 **Swiss Plasma Center (SPC), EPFL, Lausanne (CH)**

- 2022: 10 working days off site for EUROfusion WP TE TCV RT07 experimental campaign;

- 2019: 5 working days on site and 60 working days off site for EUROfusion WP MST1 TCV 2019 experimental campaign;

- 2017/2018: 12 working days on site and 15 **working days** off site for EUROfusion WP MST1 TCV experimental campaign.

2012-present ASDEX Upgrade: **Max-Plank-institut fur Plasmaphysik, Garching (DE)**

- 2022: 15 working days off site for EUROfusion WP TE AUG RT07 experimental campaign.
- 2020: 45 working days off site for EUROfusion WP MST1 AUG 2020 experimental campaign.
- 17/06/2012-28/06/2012 : Two weeks collaboration on site for theoretical and numerical-applicative activity (H&CD applications).

EDUCATION

17/02/2014 **Università Degli Studi di Milano**

- PhD on Plasma Physics, working at IFP, CNR (Milano). Title of the thesis: "Wave Energy flux and absorption of Electron Cyclotron Gaussian beams in tokamak plasmas"

15/07/2012-27/07/2012 **UKAEA Culham Science Centre, Abingdon (UK)**

- 49th Culham Plasma Physics Summer School

13/10/2010 **Università Degli Studi di Milano**

- Master's degree in Physics
- Score: 110/110 e lode
- Title of the thesis: "Study of the propagation in a plasma of radiofrequency Gaussian beams in the complex eikonal approximation"

23/10/2007 **Università Degli Studi di Milano**

- Bachelor's degree in Physics
- Score: 107/110
- Title of the thesis: "Ergodic properties of the Fermi-Pasta-Ulam model"

08/07/2002 **Liceo Scientifico Statale "Ettore Majorana", Desio (MB)**

- High school degree.
- Score: 98/100

SCIENTIFIC SKILLS

- Theory and numerical modelling of turbulent particle, heat and momentum transport in tokamaks.
- Gyrokinetic theory and its application to the turbulent transport computation by means of numerical codes.
- Theory of the propagation and absorption of Electron Cyclotron Gaussian beams in tokamak plasmas.
- Magnetohydrodynamics (MHD) theory and modelling.
- Implementation of theoretical models in numerical simulation codes.

COMPUTER SKILLS

- Very good knowledge of Microsoft Windows, Apple Mac OS X and Linux operating systems.
- Very good knowledge of programming language Fortran. Basic knowledge of C, C++.
- Very good knowledge of Matlab application.
- Good knowledge of Mathematica application

LANGUAGE SKILLS

- Italian: native speaker.
- English: fluent.
- French: basic communication skills.

PEER REVIEWED PAPERS

- 27) I. Casiraghi, P. Mantica, R. Ambrosino, L. Aucone, B. Baiocchi, L. Balbinot, A. Castaldo, J. Citrin, L. Frassinetti, P. Innocente, F. Koechl, **A. Mariani**, P. Agostinetti, S. Ceccuzzi, L. Figini, G. Granucci and M. Valisa: *Scenario modelling for the Divertor Tokamak Test facility*, Il Nuovo Cimento 45 C, 162. DOI: 10.1393/ncc/i2022-22162-0

- 26) J. Citrin, S. Maeyama, C. Angioni, N. Bonanomi, C. Bourdelle, F.J. Casson, E. Fable, T.Görler, P. Mantica, **A. Mariani**, M. Sertoli, G. Staebler, T.Watanabe and JET Contributors: *Integrated modelling and multiscale gyrokinetic validation study of ETG turbulence in a JET hybrid H-mode scenario*, Nucl. Fusion 62, 086025 (2022). DOI: 10.1088/1741-4326/ac7535

- 25) T. Tala, F. Eriksson, P. Mantica, **A. Mariani**, A. Salmi, E.R. Solano, I.S. Carvalho, A. Chomiczewska, E. Delabie, J. Ferreira, E. Fransson, L. Horvath, P. Jacquet, D. King, A. Kirjasuo, S. Leerink, E. Lerche, C. Maggi, M. Marin, M. Maslov, S. Menmuir, R.B. Morales, V. Naulin, M.F.F. Nave, H. Nordman, C. Perez von Thun, P.A. Schneider, M. Sertoli, K. Tanaka and JET contributors: *Role of NBI fuelling in contributing to density peaking between the ICRH and NBI identity plasmas on JET*, Nucl. Fusion 62, 066008 (2022). DOI: 10.1088/1741-4326/ac5667

- 24) J. Garcia, F.J. Casson, A.B. Navarro, N. Bonanomi, J. Citrin, D. King, P. Mantica, **A. Mariani**, M. Marin, S. Mazzi, E. Viezzer and JET contributors: *Modelling and theoretical understanding of the isotope effect from JET experiments in view of reliable predictions for Deuterium-Tritium plasmas*, Plasma Phys. Control. Fusion 64, 054001 (2022). DOI: 10.1088/1361-6587/ac53ef

- 23) D. Brunetti, C.J. Ham, J.P. Graves, E. Lazzaro, S. Nowak, **A. Mariani**, C. Wahlberg, W.A. Cooper, E.R. Solano, S. Saarelma, L. Frassinetti, M. Fontana, A. Kleiner, G. Bustos Ramirez, E. Viezzer and JET Contributors: *Understanding JET-C quiescent phases with edge harmonic magnetohydrodynamic activity and*

comparison with behaviour under ITER-like wall conditioning, Plasma Phys. Control. Fusion 64, 044005 (2022). DOI: 10.1088/1361-6587/ac4d3a

- 22) I. Casiraghi, P. Mantica, F. Koechl, R. Ambrosino, B. Baiocchi, A. Castaldo, J. Citrin, M. Dicorato, L. Frassinetti, **A. Mariani**, P. Vincenzi, P. Agostinetti, L. Aucone, L. Balbinot, S. Ceccuzzi, L. Figini, G. Granucci, P. Innocente, T.J. Johnson, H. Nyström and M. Valisa: *First-principle based multi-channel integrated modelling in support to the design of the Divertor Tokamak Test facility*, Nucl. Fusion 61, 116068 (2021). DOI: 10.1088/1741-4326/ac21b9

- 21) **A. Mariani**, N. Bonanomi, P. Mantica, C. Angioni, T. Goerler, O. Sauter, G.M. Staebler, Eurofusion JET1 contributors, Eurofusion MST1 contributors, ASDEX Upgrade team, TCV team, and ITPA transport & confinement group: *Experimental investigation and gyrokinetic simulations of multi-scale electron heat transport in JET, AUG, TCV*, Nucl. Fusion 61, 116071 (2021). DOI: 10.1088/1741-4326/ac1fa9

- 20) P. Mantica , N. Bonanomi , **A. Mariani** , P. Carvalho, E. Delabie, J. Garcia , N. Hawkes, T. Johnson , D. Keeling, M. Sertoli, G.M. Staebler , G. Szepesi, D. Taylor, A. Thorman and JET Contributors: *The role of electron-scale turbulence in the JET tokamak: experiments and modelling*, Nucl. Fusion 61, 096014 (2021). DOI: 10.1088/1741-4326/ac146e

- 19) **A. Mariani**, P. Mantica, I. Casiraghi,2, J. Citrin, T. Görler, G.M. Staebler and EUROfusion JET1 contributors: *Benchmark of quasi-linear models against gyrokinetic single scale simulations in deuterium and tritium plasmas for a JET high beta hybrid discharge*, Nucl. Fusion 61, 066032 (2021). DOI: 10.1088/1741-4326/abfb12

- 18) M. Nocente, Ye.O. Kazakov, J. Garcia, V.G. Kiptily, J. Ongena, M. Dreval, M. Fitzgerald, S.E. Sharapov, Z. Stancar, H. Weisen, Y. Baranov, A. Bierwage, T. Craciunescu, A. Dal Molin, E. de la Luna, R. Dumont, P. Dumortier, J. Eriksson, L. Giacomelli, C. Giroud, V. Goloborodko, G. Gorini, E. Khilkevitch, K.K. Kirov, M. Iliasova, P. Jacquet, P. Lauber, E. Lerche, M.J. Mantsinen, **A. Mariani**, S. Mazzi, F. Nabais, M.F.F. Nave, J. Oliver, E. Panontin, D. Rigamonti, A. Sahlberg, M. Salewski, A. Shevelev, K. Shinohara, P. Siren, S. Sumida, M. Tardocchi, D. Van Eester, J. Varje, A. Zohar and JET Contributors: *Generation and observation of fast deuterium ions and fusion-born alpha particles in JET D-^3He plasmas with the 3-ion radio-frequency heating scenario*, Nucl. Fusion 60, 124006 (2020). DOI: 10.1088/1741-4326/abb95d

- 17) **A. Mariani**, D. Farina and L. Figini: *Numerical analysis of the spectral broadening of the EC resonance for Gaussian beams propagating in inhomogeneous plasmas, with applications to EC H&CD in ITER*, Phys. Plasmas. 27, 072509 (2020). DOI: 10.1063/5.0011089

- 16) P. Mantica, C. Angioni, N. Bonanomi, J. Citrin, B. Grierson, F. Koechl, **A. Mariani**, G. Staebler: *Progress and challenges in understanding core transport in*

tokamaks in support to ITER operations, Plasma Phys. Control. Fusion 62, 014021 (2020). DOI: 10.1088/1361-6587/ab5ae1.

- 15) M. Nocente, A. Dal Molin, **A. Mariani**, N. Eidietis, L. Giacomelli, G. Gorini, Y. Kazakov, V. Kiptily, A. Lvovskiy, M. Mantsinen, E. Panontin, G. Papp, G. Pautasso, C. Paz-Soldan, D. Rigamonti, M. Salewski, A. Shevelev, M. Tardocchi and JET and MST1 contributors: *MeV range particle physics studies in tokamak plasmas using gamma-ray spectroscopy,* Plasma Phys. Control. Fusion 62, 014015 (2020). DOI: 10.1088/1361-6587/ab4f32.

- 14) T. Tala, H. Nordman, A. Salmi, C. Bourdelle, J. Citrin, A. Czarnecka, F. Eriksson, E. Fransson, C. Giroud, J. Hillesheim, C. Maggi, P. Mantica, **A. Mariani**, M. Maslov, L. Meneses, S. Menmuir, S. Mordijck, V. Naulin, M. Oberparleiter, G. Sips, D. Tegnered, M. Tsalas, H. Weisen and JET contributors: *Density peaking in JET – determined by fuelling or transport?,* Nucl. Fusion 59, 126030 (2019). DOI: 10.1088/1741-4326/ab4248.

- 13) **A. Mariani**, P. Mantica, S. Brunner, M. Fontana, A. Karpushov, C. Marini, L. Porte, O. Sauter, the TCV Team, and the EUROfusion MST1 Team: *Investigation of the role of electron temperature gradient modes in electron heat transport in TCV plasmas*, Nucl. Fusion 59, 126017 (2019). DOI: 10.1088/1741-4326/ab3de4.

- 12) S. Coda, M. Agostini, R. Albanese, S. Alberti, E. Alessi, S. Allan, J. Allcock, R. Ambrosino, H. Anand, Y. Andrèbe *et al.*: *Physics research on the TCV tokamak facility: from conventional to alternative scenarios and beyond*, Nucl. Fusion 59, 112023 (2019). DOI: 10.1088/1741-4326/ab25cb.

- 11) E. Joffrin, E. Joffrin, S. Abduallev, M. Abhangi, P. Abreu, V. Afanasev, M. Afzal, K.M. Aggarwal, T. Ahlgren, L. Aho-Mantila, N. Aiba *et al.*: *Overview of the JET preparation for Deuterium-Tritium Operation with the ITER Like-Wall*, Nucl. Fusion 59, 112021 (2019). DOI: 10.1088/1741-4326/ab2276.

- 10) B. Labit, T. Eich, G.F. Harrer, E. Wolfrum, M. Bernert, M.G. Dunne, L. Frassinetti, P. Hennequin, R. Maurizio, A. Merle *et al.*: *Dependence on plasma shape and plasma fueling for small ELM regimes in TCV and ASDEX Upgrade*, Nucl. Fusion 59, 086020 (2019). DOI: 10.1088/1741-4326/ab2211.

- 9) **A. Mariani**, S. Brunner, G. Merlo, O. Sauter: *Gyrokinetic analysis of radial dependence and global effects on the zero particle flux condition in a TCV plasma,* Plasma Phys. Control. Fusion 61, 064005 (2019), DOI: 10.1088/1361-6587/ab09bd.

- 8) D. Brunetti, J. Graves, E. Lazzaro, **A. Mariani**, S. Nowak, W. Cooper, C. Wahlberg: *Excitation mechanism of low-n edge harmonic oscillations in Edge Localized Modes-free, high performance, tokamak plasmas,* Phys. Rev. Lett. 122, 155003 (2019), DOI: 10.1103/PhysRevLett.122.155003.

- 7) D. Brunetti, J. Graves, E. Lazzaro, **A. Mariani**, S. Nowak, W. Cooper, C. Wahlberg: *Helical equilibrium MHD flow effects on the stability properties of low-n*

ideal external-infernal modes in weak shear tokamak configurations, Plasma Phys. Control. Fusion 61, 064003 (2019), DOI: 10.1088/1361-6587/ab0f0b.

- 6) **A. Mariani**, S. Brunner, J. Dominski, A. Merle, G. Merlo, O. Sauter, T. Görler, F. Jenko and D.Told: *Identifying microturbulence regimes in a TCV discharge making use of physical constraints on particle and heat fluxes,* Phys Plasmas 25, 012313 (2018), DOI: 10.1063/1.5006408.

- 5) D. Brunetti, J. P. Graves, E. Lazzaro, **A. Mariani**, S. Nowak, W. A. Cooper, and C. Wahlberg: *Analytic study on low-n external ideal infernal modes in tokamaks with large edge pressure gradients*, J. Plasma Phys 84, 745840201 (2018), DOI: 10.1017/S002237781800020X (featured article).

- 4) D. Brunetti, J. P. Graves, E. Lazzaro, **A. Mariani**, S. Nowak, W. A. Cooper, and C. Wahlberg: *Analytic stability criteria for edge MHD oscillations in high performance ELM free tokamak regimes*, Nucl. Fusion 58, 014002 (2018), DOI:10.1088/1741-4326/aa9456.

- 3) **A. Mariani**, G. Merlo, S. Brunner, A. Merle, O. Sauter, T. Görler, F. Jenko and D. Told: *Characterization with microturbulence simulations of the zero particle flux condition in case of a TCV discharge showing toroidal rotation reversal* J. Phys. Conf. Ser. 775, 012007 (2016), DOI: 10.1088/1742-6596/775/1/012007.

- 2) L. Figini, D. Farina, M. Henderson, **A. Mariani**, E. Poli and G. Saibene: *Assessment of the ITER electron cyclotron upper launcher capabilities in view of an optimized design*, Plasma Phys. Control. Fusion 57, 054015 (2015), DOI: 10.1088/0741-3335/57/5/054015.

- 1) O. Maj, **A. Mariani**, E. Poli and D. Farina: *The wave energy flux of high frequency diffracting beams in complex geometrical optics*, Phys. Plasmas 20, 042122 (2013), DOI: 10.1063/1.4802935.

PEER REVIEWED PAPERS: co-author, included in JET Contributors (selection)

- 12) Cannas B, Fanni A, Murari A, Pisano F, Abduallev S, Abhangi M, Abreu P, Afanasev V, Afzal M, Aggarwal KM, et al. (2019). Recurrence Plots for Dynamic Analysis of Type-I ELMs at JET With a Carbon Wall. IEEE TRANSACTIONS ON PLASMA SCIENCE, vol. 47, p. 1871-1877, ISSN: 0093-3813, doi: 10.1109/TPS.2019.2901313.

- 11) Telesca G, Ivanova-Stanik I, Zagorski R, Brezinsek S, Carvalho PJ, Czarnecka A, Giroud C, Huber A, Lerche E, Wiesen S, et al. (2019). COREDIV numerical simulation of high neutron rate JET-ILW DD pulses in view of extension to JET-ILW DT experiments. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab0c47.

- 10) Saarelma S, Frassinetti L, Bilkova P, Challis CD, Chankin A, Fridstrom R,

Garzotti L, Horvath L, Maggi CF, Abduallev S, et al. (2019). Self-consistent pedestal prediction for JET-ILW in preparation of the DT campaign. PHYSICS OF PLASMAS, vol. 26, ISSN: 1070-664X, doi: 10.1063/1.5096870.

- 9) Murari A, Lungaroni M, Gelfusa M, Peluso E, Vega J, Abduallev S, Abhangi M, Abreu P, Afanasev V, Afzal M, et al. (2019). Adaptive learning for disruption prediction in non-stationary conditions. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab1ecc.

- 8) Garcia J., Dumont R. J., Joly J., Morales J., Garzotti L., Bache T. W., Baranov Y., Casson F. J., Challis C., Kirov K., et al. (2019). First principles and integrated modelling achievements towards trustful fusion power predictions for JET and ITER. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab25b1.

- 7) Stancar Z, Gorelenkova M, Conroy S, Sauvan P, Buchanan J, Weisen H, Snoj L, Abduallev S, Abhangi M, Abreu P, et al. (2019). Multiphysics approach to plasma neutron source modelling at the JET tokamak. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab2c8b.

- 6) Bonanomi N., Casiraghi I, Mantica P., Challis C., Delabie E., Fable E., Gallart D., Giroud C., Lerche E., Lomas P., et al. (2019). Role of fast ion pressure in the isotope effect in JET L-mode plasmas. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab2d4f.

- 5) Garcia J., Doerk H., Goerler T., Abduallev S., Abhangi M., Abreu P., Afanasev V, Afzal M., Aggarwal K. M., Ahlgren T., et al. (2019). A new mechanism for increasing density peaking in tokamaks: improvement of the inward particle pinch with edge E x B shearing. PLASMA PHYSICS AND CONTROLLED FUSION, vol. 61, ISSN: 0741-3335, doi: 10.1088/1361-6587/ab31a4.

- 4) Oliver HJC, Sharapov SE, Breizman BN, Fontanilla AK, Spong DA, Terranova D, Abduallev S, Abhangi M, Abreu P, Afanasev V, et al. (2019). Modification of the Alfven wave spectrum by pellet injection. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab382b.

- 3) Van Eester D, Lerche E, Ragona R, Messiaen A, Wauters T, Abduallev S, Abhangi M, Abreu P, Afanasev V, Afzal M, et al. (2019). Ion cyclotron resonance heating scenarios for DEMO. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab318b.

- 2) Valovic M, Baranov Y, Boboc A, Buchanan J, Citrin J, Delabie E, Frassinetti L, Fontdecaba JM, Garzotti L, Giroud C, et al. (2019). Control of the

hydrogen:deuterium isotope mixture using pellets in JET. NUCLEAR FUSION, vol. 59, ISSN: 0029-5515, doi: 10.1088/1741-4326/ab3812.

- 1) Eriksson F, Fransson E, Oberparleiter M, Nordman H, Strand P, Salmi A, Tala T, Abduallev S, Abhangi M, Abreu P, et al. (2019). Interpretative and predictive modelling of Joint European Torus collisionality scans. PLASMA PHYSICS AND CONTROLLED FUSION, vol. 61, ISSN: 0741-3335, doi: 10.1088/1361-6587/ab2f45.

REFEREE/REVIEWER

- Physics of Plasmas: 1 review;
- Plasma Phys. Control. Fusion: 10 reviews, recognized on WOS;
- Nuclear Fusion: 3 reviews, recognized on WOS.

CONFERENCE TALKS

- 3) Regular oral: A. Mariani, N. Bonanomi, P. Mantica, C. Angioni, F.J. Casson, J. Citrin, T. Goerler, D. Keeling, E. Lerche, O. Sauter, M. Sertoli, G. Staebler, D. Taylor, A. Thorman, Eurofusion JET1 contributors, Eurofusion MST1 contributors, ASDEX Upgrade team, TCV team and ITPA transport & confinement group: *Experimental investigation and gyrokinetic simulations of multi-scale electron heat transport in JET, AUG and TCV*, 18th IAEA Fusion Energy Conference, Nice, France (FEC 2020: https://conferences.iaea.org/event/214/, postponed to May 10-15 2021 due to Covid-19 emergency).

- 2) Invited talk: A. Mariani, N. Bonanomi, P. Mantica, C. Angioni, F.J. Casson, J. Citrin, T. Goerler, D. Keeling, E. Lerche, O. Sauter, M. Sertoli, G. Staebler, D. Taylor, A. Thorman, Eurofusion JET1 contributors, Eurofusion MST1 contributors, ASDEX Upgrade team, TCV team and ITPA transport & confinement group: *Analysis of multiscale electron heat transport in JET, AUG and TCV plasmas, confronting experiments with gyrokinetic simulations and reduced models*, 4th Asia Pacific Conference on Plasma Physics, AAPPS-DPP2020 (e-conference: http://aappsdpp.org/DPP2020/index.html).

- 1) Invited, plenary: **A. Mariani**, G. Merlo, S. Brunner, A. Merle, O. Sauter, F. Jenko, T. Görler and D. Told: *characterization of the microturbulence regime in case of a TCV discharge showing toroidal rotation reversal*, TTF Workshop, Williamsburg (US-VA), 2017

CONFERENCE CONTRIBUTED POSTERS (only first author)

- 9) **A. Mariani**, S. Brunner, G. Merlo, O. Sauter: *Global `zero particle flux'-driven gyrokinetic analysis of the density profile for a TCV plasma, compared with gradient-driven and quasi-linear results*, Theory of fusion plasmas, joint Varenna-Lausanne international workshop, Varenna, 2022.

- 8) **A. Mariani**, A. Balestri, I. Casiraghi, P. Mantica, R. Ambrosino, A. Castaldo, L. Balbinot, S. Cipelli, L. Frassinetti, V. Fusco, P. Innocente, O. Sauter, G. Vlad: *Transport analysis of a DTT negative triangularity scenario*, 48th European Physical Society Conference on Plasma Physics (EPS), online, 2022.

- 7) Regular twin poster: **A. Mariani**, N. Bonanomi, P. Mantica, C. Angioni, F.J. Casson, J. Citrin, T. Goerler, D. Keeling, E. Lerche, O. Sauter, M. Sertoli, G. Staebler, D. Taylor, A. Thorman, Eurofusion JET1 contributors, Eurofusion MST1 contributors, ASDEX Upgrade team, TCV team and ITPA transport & confinement group: *Experimental investigation and gyrokinetic simulations of multi-scale electron heat transport in JET, AUG and TCV*, 28th IAEA Fusion Energy Conference, Nice, France (FEC 2020: https://conferences.iaea.org/event/214/, postponed to May 10-15 2021 due to Covid-19 emergency).

- 6) **A. Mariani**, P. Mantica, S. Brunner, M. Fontana, A. Karpushov, C. Marini, L. Porte, O. Sauter, the TCV Team and the EUROfusion MST1 Team: *Investigation of the impact of ETGs on electron heat transport in TCV plasmas with NBI and ECH injection*, to be presented at the 46th European Physical Society Conference on Plasma Physics (EPS), Milano, 2019.

- 5) **A. Mariani**, P. Mantica, N. Bonanomi, S. Brunner, M. Fontana, A. Karpushov, C. Marini, L. Porte, O. Sauter, and the TCV Team and t the EUROfusion MST1 Team: *Investigation of the role of ETGs in electron heat transport in TCV plasmas*, TTF Workshop, Seville, 2018.

- 4) **A. Mariani**, S. Brunner, G. Merlo, O. Sauter: *Gyrokinetic analysis of global effects on the zero particle flux condition in a TCV plasma*, Theory of fusion plasmas, joint Varenna-Lausanne international workshop, Varenna, 2018.

- 3) **A. Mariani**, G. Merlo, S. Brunner, A. Merle, O. Sauter, F. Jenko, T. Görler and D. Told: *characterization of the microturbulence regime in case of a TCV discharge showing toroidal rotation reversal*, TTF Workshop, Williamsburg (US-VA), 2017.

- 2) **A. Mariani**, G. Merlo, S. Brunner, A. Merle, O. Sauter, T. Görler and D. Told: *Characterization with microturbulence simulations of the zero particle flux condition in case of a TCV discharge showing toroidal rotation reversal*, Theory of fusion plasmas, joint Varenna-Lausanne international workshop, Varenna, 2016.

- 1) **A. Mariani**, G. Merlo, S. Brunner, A. Merle, O. Sauter, F. Jenko and D. Told: *Assessment of micro-turbulence regimes in TCV discharges showing intrinsic rotation using gyrokinetic simulations*, 57th Annual Meeting of the American Physical Society (APS) Division of Plasma Physics, Savannah (US-GA), 2015.

CONFERENCE PROCEEDINGS

- 7) **A. Mariani**, N. Bonanomi, P. Mantica, C. Angioni, F.J. Casson, J. Citrin, T. Goerler, D. Keeling, E. Lerche, O. Sauter, M. Sertoli, G.M. Staebler, D. Taylor, A.

Thorman, Eurofusion JET1 contributors, Eurofusion MST1 contributors, ASDEX Upgrade team, TCV team, and ITPA transport & confinement group: *Experimental investigation and gyrokinetic simulations of multi-scale electron heat transport in JET, AUG and TCV*, 28th IAEA Fusion Energy Conference, Nice, France (FEC 2020: https://conferences.iaea.org/event/214/, postponed to May 10-15 2021 due to Covid-19 emergency).

- 6) **A. Mariani**, P. Mantica, S. Brunner, M. Fontana, A. Karpushov, C. Marini, L. Porte, O. Sauter, the TCV Team and the EUROfusion MST1 Team: *Investigation of the impact of ETGs on electron heat transport in TCV plasmas with NBI and ECH injection*, 46th EPS Conference on Plasma Physics, July 8-12, 2019, Milano, Italy.

- 5) D. Brunetti, J. P. Graves, E. Lazzaro, **A. Mariani**, S. Nowak, W. A. Cooper, C. Wahlberg, E. R. Solano, S. Saarelma and JET Contributors: *Theory of external-infernal modes in high performance quiescent tokamak regimes,* 46th EPS Conference on Plasma Physics, July 8-12, 2019, Milano, Italy.

- 4) T. Tala, A. Salmi, S. Mordicjk, H. Nordman, F. Eriksson, E. Fransson, M. Oberparleiter, A. Skyman, P. Strand, D. Tegnered, C. Bourdelle, J. Citrin, A. Czarnecka, C. Giroud, J. Hillesheim, C. Maggi, M. Maslov, S. Menmuir, A. Hubbard, J. W. Hughesm, E. Tolman, P. Mantica, **A. Mariani**, G. Mckee, L. Meneses, M. Tsalas, V. Naulin, T. Rhodes, G. Sips, H. Weisen and JET contributors: *Core density peaking experiments in JET, DIII-D and C-MOD in various operational scenarios-driven by fueling or transport?,* 27th IAEA Fusion Energy Conference (FEC), October 22-27 ,2018, Ahmedabad, India.

- 3) S. Coda *et al.*: *Physics research on the TCV tokamak facility: from conventional to alternative scenarios and beyond*, 27th IAEA Fusion Energy Conference (FEC), October 22-27, 2018, Ahmedabad, India.

- 2) D Farina, E Poli, L Figini, O Maj, **A Mariani**, H Weber, T Goodman, O Sauter, M Cavinato, G Saibene, M Henderson: *ECCD requirements and criteria for NTM stabilization in ITER scenarios*, 41st EPS Conference on Plasma Physics, June 23 – 27, 2014, Berlin, Germany.

- 1) E Poli, D Farina, L Figini, **A Mariani**, T Goodman, O Sauter, M Cavinato, G Saibene and M Henderson: *ECCD capabilities for NTM stabilization via the Upper Launcher from ramp-up to ramp-down phases of ITER scenarios*, 40th EPS Conference on Plasma Physics, July 1-5, 2013, Espoo, Finland.

INTERNAL REPORTS

- 1) D. Farina, L. Figini, **A. Mariani**: *Documentation of the GRAY code*, Internal

report of the IFP, CNR, Milano, FP/12/08 (2012).

Carate Brianza, 24/08/2022