



# DIFFER LISTINGS & OUTPUT 2022



## Preface

Here you find the list of the most important output of our institute. In years past, we published it as an appendix to the annual report. Now, it is bundled in this document.

This document provides an overview of DIFFER's output. It includes listings of media appearances, PhD theses, MSc and BSc theses. It lists our publications in peer-reviewed scientific journals, other journals, and conference proceedings. And it mentions those who have guest lectured at conferences, meetings, and seminars or presented posters, or given other presentations. It also sums up awards and positions (including editorships).

For the first time, we have an *open software and databases category*. That's an increasingly important category in the age of open science.

The lists are categorized along our two research lines: fusion energy and solar fuels

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*Cover image (part front and part back): In the summer of 2023, Emma Werkhoven and Lex Mannens, two students from the Design Academy Eindhoven are transforming the gray six-meter-long and one-and-a-half-meter-wide tube of DIFFER's Ion Beam Facility into a true work of art. One side will have a cutaway-like character with mainly purple and pink colors. Those colors are a reference to the colors of a plasma that is generated in the tube. The other side will be orange, the color of the Netherlands. Also, on that side, there will be space for DIFFER's logo and for posters about the research it facilitates.*  
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## 1. Scientific Output DIFFER Fusion Energy in 2022

### 1.1 PhD theses: 4

1. A. Perek, *Development and application of quantitative multispectral imaging in nuclear fusion research*, PhD thesis at the Eindhoven University of Technology, 2022/04/13, Promotors: N.J. Lopes Cardozo, M.R. de Baar; Co-promotor: I.G.J. Classen
2. V.S. Marques Pereira, *ODS steels for nuclear applications: thermal stability of the microstructure and evolution of defects*, PhD thesis at the Delft University of Technology, 2022/05/06, Promotor: J. Sietsma; Co-promotor: H. Schut
3. J. van den Berg, *Plasma-wall interaction processes in dense thermal plasmas*, PhD thesis at the Eindhoven University of Technology, 2022/07/08, Promotors: G.J. van Rooij, N.J. Lopes Cardozo; Co-promotor: H.J. van der Meiden
4. R. Chandra, *Plasma exhaust for fusion reactors: numerical simulation and comparison with plasma beam experiments*, PhD thesis at the Eindhoven University of Technology, 2022/02/17, Promotors: N.J. Lopes Cardozo, M.R. de Baar; Co-promotor: H.J. de Blank

### 1.2 Master thesis & Bachelor thesis: 4

1. K. Schutjes, *TALIF in divertor-relevant plasmas: measuring density and temperature of ground-state hydrogen atoms in a linear plasma device*, Master thesis Eindhoven University of Technology, 2022/06/27, Mentors: G.J. van Rooij, I.G.J. Classen, H.J. van der Meiden
2. C.J. Meekes, *Real-time modelling of fusion plasmas and the consequences of a simplified ion cyclotron resonance heating model*, Master thesis Eindhoven University of Technology, 2022/01/20, Mentors: M.R. de Baar, G.J. van Rooij,
3. B. Kool, *An analysis of divertor plasma dynamics for detachment control on MAST-U*, Master thesis Eindhoven University of Technology, 2022/01/17, Mentors: J.T.W. Koenders, M. van Berkel
4. D. van Elk, *Modelling of pellet delivery uncertainty from the centrifuge pellet injector for core plasma fuelling*, Bachelor thesis Avans University of Applied Sciences, 2022/06/17, Mentors: T.O.S.J. Bosman, M. van Berkel

### 1.3 Publications in peer-reviewed scientific journals: 50

1. D.R. Hatch, C. Michoski, D. Kuang, B. Chapman-Oplopoiou, M. Curie, M. Halfmoon, E. Hassan, M. Kotschenreuther, S. Mahajan, G. Merlo, et al., *Reduced models for ETG transport in the pedestal*, Phys. Plasmas 29 (2022) 062501
2. P. Vincenzi, E.R. Solano, E. Delabie, C. Bourdelle, G. Snoep, A. Baciero, G. Birkenmeier, P. Carvalho, M. Cavedon, J. Citrin, et al., *Power balance analysis at the L-H transition in JET-ILW NBI-heated deuterium plasmas*, Plasma Phys. Control. Fusion 64 (2022) 124004
3. J.M. Duff, B.J. Faber, C.C. Hegna, M.J. Pueschel, P.W. Terry, *Effect of triangularity on ion-temperature-gradient-driven turbulence*, Phys. Plasmas 29 (2022) 012303
4. C. Onwudinanti, M. Pols, G. Brocks, J.M.V.A. Koelman, A.C.T. van Duin, T.W. Morgan, S. Tao, *A ReaxFF molecular dynamics study of hydrogen diffusion in ruthenium - the role of grain boundaries*, J. Phys. Chem. C 126 (2022) 5950-5959
5. G. Derks, J.P.K.W. Frankemölle, J.T.W. Koenders, M. van Berkel, H. Reimerdes, M. Wensing, E. Westerhof, *Benchmark of a self-consistent 1D divertor model DIV1D using the 2D SOLPS-ITER code*, Plasma Phys. Control. Fusion 64 (2022) 125013
6. I. Casiraghi, P. Mantica, R. Ambrosino, L. Aucone, B. Baiocchi, L. Balbinot, A. Castaldo, J. Citrin, L. Frassinetti, P. Innocente, et al., *Scenario modelling for the Divertor Tokamak Test facility*, Nuovo Cim. C 45 (2022) 162
7. V.S. Marques Pereira, S. Wang, T.W. Morgan, H. Schut, J. Sietsma, *Microstructural evolution and behaviour of deuterium in a ferritic ODS 12 Cr steel annealed at different temperatures*, Metall. Mater. Trans. A 53 (2022) 874-892
8. B. Tripathi, A.E. Fraser, P.W. Terry, E.G. Zweibel, M.J. Pueschel, *Near-cancellation of up- and down-gradient momentum transport in forced magnetized shear-flow turbulence*, Phys. Plasmas 29 (2022) 092301
9. P. Reichherzer, J. Becker Tjus, E.G. Zweibel, L. Merten, M. Pueschel, *Anisotropic cosmic-ray diffusion in isotropic Kolmogorov turbulence*, Mon. Not. Roy. Astron. Soc. 514 (2022) 2658-2666

10. H. Raj, C. Theiler, A. Thornton, O. Fevrier, S. Gorno, F. Bagnato, P. Blanchard, C. Colandrea, H. de Oliveira, A. Perek, et al., *Improved heat and particle flux mitigation in high core confinement, baffled, alternative divertor configurations in the TCV tokamak*, Nucl. Fusion 62 (2022) 126035
11. R. Chandra, H.J. de Blank, P. Diomede, E. Westerhof, *B2.5-Eunomia simulations of Magnum-PSI detachment experiments: II. Collisional processes and their relevance*, Plasma Phys. Control. Fusion 64 (2022) 015001
12. G.M. Staebler, M. Knölker, P.B. Snyder, C. Angioni, E. Fable, T. Luda di Cortemiglia, C. Bourdelle, J. Garcia, J. Citrin, M. Marin, *Advances in prediction of tokamak experiments with theory-based models*, Nucl. Fusion 62 (2022) 042005
13. Y. Li, T. Vermeij, J.P.M. Hoefnagels, Q. Zhu, T.W. Morgan, *Influence of porosity and blistering on the thermal fatigue behavior of tungsten*, Nucl. Fusion 62 (2022) 076039
14. C. Costin, I. Mihaila, H.J. van der Meiden, J. Scholten, H.J.N. van Eck, J.W.M. Vernimmen, *Advances in Magnum-PSI probe diagnosis in support of plasma-surface interaction studies*, Plasma Phys. Control. Fusion 64 (2022) 125008
15. R.J.R. van Kampen, U. Schneidewind, C. Anibas, A. Bertagnoli, D. Tonina, G. Vandersteen, C.H. Luce, S. Krause, M. van Berkel, *LPMLen - A frequency domain method to estimate vertical streambed fluxes and sediment thermal properties in semi-infinite and bounded domains*, Water Resources Research 58 (2022) e2021WR030886
16. B. Tripathi, A.E. Fraser, P.W. Terry, E.G. Zweibel, M.J. Pueschel, *Mechanism for sequestering magnetic energy at large scales in shear-flow turbulence*, Phys. Plasmas 29 (2022) 070701
17. J.H.E. Proll, G.G. Plunk, B.J. Faber, T. Görler, P. Helander, I.J. McKinney, M.J. Pueschel, H.M. Smith, P. Xanthopoulos, *Turbulence mitigation in maximum-J stellarators with electron-density gradient*, J. Plasma Phys. 88 (2022) 905880112
18. N. Babinov, A. Razdobarin, I. Bukreev, D. Kirilenko, Z. Lyullin, E. Mukhin, A. Sitnikova, L. Varshavchik, T.W. Morgan, S. Brons, et al., *Three-dimensional modelling of sputtered materials transport in diagnostic ducts of fusion devices*, Nucl. Fusion 62 (2022) 126004
19. J. Mailloux, N. Abid, K. Abraham, P. Abreu, J. Citrin, A. Ho, M. Marin, C.J. Meekes, K.L. van de Plassche, et al., I. Zychor, *Overview of JET results for optimising ITER operation*, Nucl. Fusion 62 (2022) 042026
20. S. Wang, E. Zoethout, M. van Kampen, T.W. Morgan, *Surface-limited deuterium uptake of Ru films under plasma exposure*, J. Appl. Phys. 132 (2022) 225903
21. H. Reimerdes, M. Agostini, M.R. de Baar, I.G.J. Classen, M. van Berkel, G.M.D. Hogewey, R. Chandra, A. Perek, R.J. R. van Kampen, T.A. Wijkamp, et al., *Overview of the TCV tokamak experimental programme*, Nucl. Fusion 62 (2022) 042018
22. W. Ou, P. Rindt, K. Li, W. Arnold Bik, T.W. Morgan, *Deuterium retention and removal in liquid lithium determined by in-situ NRA in Magnum-PSI*, Nucl. Fusion 62 (2022) 076010
23. T. Sunn Pedersen, I. Abramovic, P. Agostinetti, M. Agredano Torres, S. Akaslompolo, J. Alcuson Belloso, P. Aleynikov, K. Aleynikova, M.J. Pueschel, M.R. de Baar, et al., *Experimental confirmation of efficient island divertor operation and successful neoclassical transport optimization in Wendelstein 7-X*, Nucl. Fusion 62 (2022) 042022
24. P.T. Lang, T.O.S.J. Bosman, C. Day, T. Giegerich, M. Kircher, O. Kudlacek, G. Phillips, B. Ploeckl, B. Sieglin, J. Tretter, et al., *Concept for a multi-purpose EU-DEMO pellet launching system*, Fusion Eng. Des. 185 (2022) 113333
25. J. Garcia, F.J. Casson, A. Banon Navarro, N. Bonanomi, J. Citrin, D. King, P. Mantica, A. Mariani, M. Marin, S. Mazzi, et al., *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 (2022) 054001
26. H. de Oliveira, C. Theiler, O. Fevrier, H. Reimerdes, B.P. Duval, C.K. Tsui, S. Gorno, D.S. Oliveira, A. Perek, TCV team, *New insights on divertor parallel flows,  $E \times B$  drifts, and fluctuations from in situ, two-dimensional probe measurement in the Tokamak à Configuration Variable*, Nucl. Fusion 62 (2022) 096028
27. J.H. Slief, R.J.R. van Kampen, M.W. Brookman, M. van Berkel, *Extension of the flux fit method for estimating power deposition profiles*, Phys. Plasmas 29 (2022) 010703
28. Y. Hayashi, H. Tanaka, N. Ohno, S. Kajita, T.W. Morgan, H.J. van der Meiden, J. Scholten, J.W.M. Vernimmen, H. Natsume, K. Sawada, et al., *Reduction of pulsed particle load with dynamic pressure induced by transient recycled neutral flux*, Plasma Phys. Control. Fusion 64 (2022) 105013
29. A. Perek, M. Wensing, K. Verhaegh, B. Linehan, H. Reimerdes, C. Bowman, M. van Berkel, I.G. J. Classen, B.P. Duval, O. Fevrier, et al., *A spectroscopic inference and SOLPS-ITER comparison of flux-resolved edge plasma parameters in detachment experiments on TCV*, Nucl. Fusion 62 (2022) 096012
30. L. Martinelli, D. Mikitchuck, B.P. Duval, Y. Andrebe, P. Blanchard, O. Fevrier, S. Gorno, H. Elaian, B. Linehan, A. Perek, et al., *Implementation of high-resolution spectroscopy for ion (and electron) temperature*

- measurements of the divertor plasma in the Tokamak a configuration variable*, Rev. Sci. Instrum. 93 (2022) 123505
31. C.C. Hegna, D.T. Anderson, A. Bader, T. Bechtel, A. Bhattacharya, M. Cole, M. Drevlak, J.M. Duff, B.J. Faber, M.J. Pueschel, et al., *Improving the stellarator through advances in plasma theory*, Nucl. Fusion 62 (2022) 042012
  32. M. Yoshikawa, H. Tanaka, Y. Hayashi, S. Kajita, H.J. van der Meiden, J.W.M. Vernimmen, T.W. Morgan, J. Kohagura, Y. Shima, S. Togo, et al., *Effects from the target plate geometry on fluctuations of helium plasma in the Linear Divertor Simulator Magnum-PSI*, Plasma Fusion Res. 17 (2022) 1402100
  33. P. Reichherzer, L. Merten, J. Dörner, J. Becker Tjus, M.J. Pueschel, E.G. Zweibel, *Regimes of cosmic-ray diffusion in Galactic turbulence*, SN. Appl. Sci. 4 (2022) 15
  34. M.E. Fenstermacher, DIII-D Team, J. Abbate, G. Snoep, R.J. R. van Kampen, et al., *DIII-D research advancing the physics basis for optimizing the tokamak approach to fusion energy*, Nucl. Fusion 62 (2022) 042024
  35. J.T.W. Koenders, M. Wensing, T. Ravensbergen, O. Fevrier, A. Perek, M. van Berkel, TCV team, EUROfusion MST1 Team, *Systematic extraction of a control-oriented model from perturbative experiments and SOLPS-ITER for emission front control in TCV*, Nucl. Fusion 62 (2022) 066025
  36. J. Gonzalez, R. Chandra, H.J. de Blank, E. Westerhof, *Comparison between SOLPS-ITER and B2.5-Eunomia for simulating Magnum-PSI*, Plasma Phys. Control. Fusion 64 (2022) 105019
  37. J.P. Goedbloed, R. Keppens, *The super-alfvenic rotational instability in accretion disks about black holes*, Astrophys. J. Suppl. Ser. 259 (2022) 65
  38. D. Chaykina, I. Usman, G. Colombi, H. Schreuders, B. Tyburska-Pueschel, Z. Wu, S.W. H. Eijt, L.J. Bannenberg, G.A. de Wijs, B. Dam, *Aliovalent calcium doping of yttrium oxyhydride thin films and implications for photochromism*, J. Phys. Chem. C 126 (2022) 14742–14749
  39. M. Reinhart, S. Brezinsek, A. Kirschner, J. W. Coenen, T. Schwartz-Selinger, K. Schmid, A. Hakola, H.J. van der Meiden, R. Dejarnac, E. Tsitrone, et al., *Latest results of EUROfusion plasma-facing components research in the areas of power loading, material erosion and fuel retention*, Nucl. Fusion 62 (2022) 042013
  40. J. Citrin, S. Maeyama, C. Angioni, N. Bonanomi, C. Bourdelle, F.J. Casson, E. Fable, T. Görler, P. Mantica, A. Mariani, et al., *Integrated modelling and multiscale gyrokinetic validation study of ETG turbulence in a JET hybrid H-mode scenario*, Nucl. Fusion 62 (2022) 086025
  41. L. Conde, J. Gonzalez, J.M. Donoso, J.L. Domenech-Garret, M.A. Castillo, *Thrust measurements and mesothermal plasma plume of the alternative low power hybrid ion engine (alphie)*, J. Electr. Propuls. 1 (2022) 24
  42. S. Kajita, I. Sho, H. Tanaka, D. Nishijima, K. Fujii, H.J. van der Meiden, N. Ohno, *Use of machine learning for a helium line intensity ratio method in Magnum-PSI*, Nucl. Mater. Energy 33 (2022) 101281
  43. D. Borodin, F. Schluck, S. Wiesen, D. Harting, P. Boerner, S. Brezinsek, W. Dekeyser, S. Carli, E. Westerhof, J. Gonzalez Munoz, et al., *Fluid, kinetic and hybrid approaches for neutral and trace ion edge transport modelling in fusion devices*, Nucl. Fusion 62 (2022) 086051
  44. S.C. Wang, R.M. van der Horst, M. van Kampen, T.W. Morgan, *Application of a dual-thermopile radical probe to expanding hydrogen plasmas*, Plasma Sources Sci. Technol. 31 (2022) 085011
  45. T. Tala, F. Eriksson, P. Mantica, A. Mariani, A. Salmi, E.R. Solano, I.S. Carvalho, A. Chomiczewska, E. Delabie, M. Marin, et al., *Role of NBI fuelling in contributing to density peaking between the ICRH and NBI identity plasmas on JET*, Nucl. Fusion 62 (2022) 066008
  46. M. Kasaki, K. Nagaoka, J. Slief, Y. Haba, R. Nakamoto, K. Tsumori, H. Nakano, K. Ikeda, M. Osakabe, *Nonuniform plasma meniscus modelling based on backward calculation of negative ion beamlet*, Nucl. Fusion 62 (2022) 106031
  47. L. Conde, P.E. Maldonado, J. Damba, J. Gonzalez, J.L. Domenech-Garret, J.M. Donoso, M.A. Castillo, *Physics of the high specific impulse alternative low power hybrid ion engine (alphie): direct thrust measurements and plasma plume kinetics*, J. Appl. Phys. 131 (2022) 023302
  48. D. Garfias, M. Morbey, Y. Narushima, N. Yanagi, *Simulation of non-uniform current distribution in stacked HTS tapes*, Plasma Fusion Res. 17 (2022) 2405066
  49. X. Litaudon, F. Jenko, D. Borba, D. Borodin, B. Braams, S. Brezinsek, I. Calvo, R. Coelho, A.J.H. Donné, O. Embreus, et al., *EUROfusion-theory and advanced simulation coordination (E-TASC): programme and the role of high performance computing*, Plasma Phys. Control. Fusion 64 (2022) 034005
  50. C.K. Tsui, J. Boedo, D. Brida, O. Fevrier, G.F. Harrer, A. Perek, H. Reimerdes, B.P. Duval, S. Gorno, U. Sheikh, et al., *Evidence on the effects of main-chamber neutrals on density shoulder broadening*, Phys. Plasmas 29 (2022) 062507

**1.4 Publications in other journals and conference proceedings: 15**

1. R.J.R. van Kampen, S. Weiland, H.J. Zwart, M. van Berkel, *A frequency domain maximum likelihood approach to estimate space-dependent parameters in heat and mass transport*, Book of Abstracts 41st Benelux Meeting on Systems and Control (2022) 200
2. G.L. Derks, J.P.K.W. Frankemölle, M. van Berkel, J.T.W. Koenders, H. Reimerdes, M. Wensing, E. Westerhof, *Benchmarking DIV1D on SOLPS-ITER simulations of TCV plasmas*, Proceedings 48th EPS Conference on Plasma Physics (2022) 436
3. L. Kogan, D. Ryan, S. Gibson, J. Berkery, S.A. Sabbagh, T. Farley, P. Ryan, K. Verhaegh, B. Kool, T.A. Wijkamp, et al., *First MAST-U equilibrium reconstructions using the EFIT++ Code*, Proceedings 48th EPS Conference on Plasma Physics (2022) 448
4. T. Beernaert, P. Etman, M. De Bock, I. Classen, M.R. de Baar, *Challenges of big-science: a matrix-based interface model to manage technical integration risks In multi-organizational engineering projects*, Proceedings of the 24th International Dependency and Structure Modelling Conference (DSM 2022) DS 121 (2022) 1-10
5. S. Gabriellini, V.K. Zotta, L. Garzotti, C. Bourdelle, F.J. Casson, J. Citrin, D. Frigione, R. Gatto, M. Marin, E. Giovannozzi, et al., *Neon seeding effects on two JET high performance baseline plasmas*, Proceedings 48th EPS Conference on Plasma Physics (2022) 427
6. J. Gonzalez, G.F. Nallo, E. Westerhof, *Self-consistent simulation of Magnum-PSI target in SOLPS-ITER with a finite element wall model*, Proceedings 48th EPS Conference on Plasma Physics (2022) 223
7. J.T.W. Koenders, M. van Berkel, G.L. Derks, H. Reimerdes, E. Westerhof, TCV team, *Development of physics based control-oriented models for the heat exhaust in fusion power plants*, Book of Abstracts 41st Benelux Meeting on Systems and Control (2022) 39
8. J. Gonzalez Munoz, L. Conde, J.M. Donoso, J.L. Domenech-Garret, M.A. Castillo, *Measurements and kinetic simulations of the alternative low power hybrid ion engine (alphie)*, Proceedings 48th EPS Conference on Plasma Physics (2022) 433
9. M. Hamed, M.J. Pueschel, J. Citrin, M. Muraglia, X. Garbet, Y. Camenen, *Linear stability of the JET H-mode pedestal*, Journal of Physics: Conference Series 2397 (2022) 012013
10. T.O.S.J. Bosman, M. van Berkel, M.R. de Baar, *Offset-free model predictive control of the electron density profile in a tokamak*, Book of Abstracts 41st Benelux Meeting on Systems and Control (2022) 158
11. J. Barr, T. Madula, L. Zaniszi, A. Ho, J. Citrin, A. Gopakumar, JET Contributors, *An active learning pipeline for surrogate models of gyrokinetic turbulence*, Proceedings 48th EPS Conference on Plasma Physics (2022) 374
12. J.H. Slief, R.J.R. van Kampen, M.W. Brookman, M. van Berkel, *Flux fit method for estimating transport parameters in nuclear fusion reactors based on perturbation analysis*, Book of Abstracts 41st Benelux Meeting on Systems and Control (2022) 201
13. D. Dyubo, J. Gonzalez Munoz, O. Tsybin, L. Conde, *Optimizing of ALPHIE grid system with particle-in-cell simulations*, Springer Proceedings in Physics, Proceedings of the YETI 2021 268 (2022) 271-280
14. P.T. Lang, M. van Berkel, W. Biel, T.O.S.J. Bosman, P. David, C. Day, E. Fable, L. Giannone, T. Giegerich, A. Kallenbach, et al., *Real time monitoring of pellet delivery to facilitate burn control in EU-DEMO*, Proceedings 48th EPS Conference on Plasma Physics (2022) 93
15. G. Federici, A.J.H. Donn , *Introduction special issue on European programme towards DEMO: outcome of the pre-conceptual design phase*, Fusion Engineering and Design 178 (2022) 113102

**1.5 Professional publications: 1**

1. M. van Berkel, J. Koenders, A. Perek, *Measuring a fusion plasma with cameras*, Mikroniek 62 (2022) 8-12

**1.6 Open software: 1**

1. P. Smeets, V. Azizi, A. Ho, *Duqtools (tool for dynamic uncertainty quantification for tokamak reactor simulations modelling)*, Research Software Directory and [github.com/duqtools/](https://github.com/duqtools/), 11/2022

**1.7 Invited lectures at conferences and meetings: 16**

1. MDPI Applied Sciences Webinars 2022 *Advances in Microwave/Millimeter-Wave Diagnostics and Their Applications*, 2022/03/10, Online, Switzerland, A.J.H. Donn , *A brief history of microwave imaging*



2. Frontiers for Fusion Week, University of York, 2022/04/25-2022/04/27, York, UK, A.J.H. Donné, *The EU fusion programme: progress and plans*
3. Annual Meeting FinnFusion 2022, 2022/05/04, Helsinki, Finland, A.J.H. Donné, *EUROfusion: JET results and DEMO*
4. Technical Meeting on Synergies in Technology Development between Nuclear Fission and Fusion for Energy Production, 2022/06/06-2022/06/10, Online, Vienna, Austria, G. Lange, G. Federici, A.J.H. Donné, et al., *EUROfusion human resources development, training and knowledge management: next steps to bringing the fusion research community to the nuclear new build era*
5. 21st Joint Workshop on Electron Cyclotron Emission (ECE) and Electron Cyclotron Resonance Heating (ECRH) (EC-21-2020), 2022/06/20-2022/06/24, Cadarache, France, M. van Berkel, M.W. Brookman, R.J.R. van Kampen, J.H. Slief, *Broadening estimation of the ECRH deposition profile using perturbative experiments*
6. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, T.W. Morgan, *Linear plasma devices as tools to study plasma surface interactions and divertor physics*, Plenary I5.003
7. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, A. Perek, M. Wensing, K. Verhaegh, B.L. Linehan, H. Reimerdes, C. Bowman, M. van Berkel, I.G.J. Classen, B.P. Duval, O. Fevrier, *Quantitative Balmer line analysis of multispectral imaging data to infer 2D maps of edge plasma parameters in TCv*, I2.104
8. Joint International conference Functional Materials and Nanotechnologies and Nanotechnology and Innovation in the Baltic Sea region (FMandNT-NIBS 2022), 2022/07/04-2022/07/06, Riga, Latvia, A.J.H. Donné, *Why don't we have fusion yet?*
9. ASDEX Upgrade (AUG) Seminar Max-Planck Institute for Plasma Physics IPP, 2022/07/11, Garching, Germany, M.R. de Baar, *A system and control approach to fusion plasmas*
10. 61st Meeting International Fusion Research Council, 2022/07/20-2022/07/22, Online, Austria, A.J.H. Donné, *EUROfusion - The European Fusion Research Programme*
11. 32nd Symposium on Fusion Technology (hybrid) SOFT 2022, 2022/09/18-2022/09/23, Dubrovnik, Croatia, A.J.H. Donné, *Navigating along the fusion roadmap*, IP-2.2
12. 24th International Dependency and Structure Modelling Conference DSM 2022 Challenges of big-science, 2022/10/11-2022/10/13, Eindhoven, Netherlands, M.R. de Baar, T. Beernaert, P. Etman, M. De Bock, I. Classen, *A systems approach to nuclear fusion plasma*
13. Meeting of ITPA Diagnostics Topical Group (DG), 2022/10/12, Cadarache, France, M.R. de Baar, D. Mazon, M. van Berkel, P.C. de Vries, *JEX proposal on density distribution observation and control*
14. Colloquium on the occasion of the re-commissioning of the MaPLE Upgrade Facility, 2022/10/14, Karlsruhe, Germany, A.J.H. Donné, *EUROfusion perspectives in FP9*
15. Croatia-Spanish Forum IFMIF-DONES 2022, 2022/11/17, Zagreb, Croatia, A.J.H. Donné, *IFMIF-DONES on the European fusion roadmap*
16. IAEA Webinar: Building stars: breakthroughs in fusion R&D, 2022/03/24, Online, Austria, A.J.H. Donné, I. Chapman, A. Kappatou, C.F. Maggi, J. Mailloux, V. Naulin, F.G. Rimini, JET Contributors, *Latest results from the JET DT campaign*

### 1.8 Invited seminars: 9

1. 2022 Seminar EAST Team, 2022/01/14, Online, Heifei, China, M.R. de Baar, *A systems and control perspective on fusion plasmas*
2. Webinar Nederlandse Vereniging Duurzame Energie NVDE, 2022/01/27, Online, Netherlands, M.R. de Baar, *Morgen begint vandaag: kernfusie*
3. Seminar Tata Institute of Fundamental Research (TIFR), 2022/03/23, Mumbai, India, A.J.H. Donné, *Progress along the path towards fusion electricity*
4. Seminar Politecnico di Milano, 2022/04/20, Milan, Italy, A.J.H. Donné, *Why don't we have fusion yet?*
5. Seminar Dutch Institute for Fundamental Energy Research, 2022/05/17, Eindhoven, Netherlands, A.J.H. Donné, *The EU fusion programme: progress and plans*
6. ESA Summer School 2022 Comparative Plasma Physics in the Universe, 2022/07/12-2022/07/21, Alpbach, Austria, A.J.H. Donné, *Why don't we have fusion yet?*
7. 9th School on Plasmas in Super-Intense Laser Fields 2022, 2022/07/01-2022/07/11, Erice, Italy, A.J.H. Donné, *Magnetic confinement fusion. Science and technology*



8. Ringberg Seminar, 2022/09/12, Tegernsee, Germany, T.O.S.J. Bosman, M. Bernert, P.T. Lang, J.T.W. Koenders, O. Kudlacek, B. Sieglin, M.R. de Baar, M. van Berkel, *How system-identification can help improve the control performance at AUG*
9. Seminar Canadian Light Source, synchrotron, 2022/11/17, Saskatoon, Canada, A.J.H. Donné, *European strategy towards clean fusion energy*

### 1.9 Oral & poster presentations at (international) conferences & meetings: 72

1. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, S.C. Wang, *Influence of surface impurities on deuterium uptake of Ru-capped extreme ultraviolet (EUV) mirrors*, Oral PW10A.2
2. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, A. Perek, M. Wensing, K. Verhaegh, B. Linehan, H. Reimerdes, C. Bowman, M. van Berkel, I.G.J. Classen, B. Duval, J.T.W. Koenders, et al., *A spectroscopic inference and SOLPS-ITER comparison of flux-resolved plasma edge parameters in TCV*, Oral PW10A.1
3. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, V. Vollema, A. Troglia, G.A. Kanoutas, R. Bliem, G. Portale, B. Tyburska-Pueschel, J. Frenken, *Suppression of hydrogen blistering in Mo/Si multilayers: the effect of deposition pressure*, Oral PT09B.4
4. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, T. Wijkamp, J.S. Allcock, X. Feng, J. Harrison, B. Kool, B. Lipschultz, A. Perek, R. Sharples, K. Verhaegh, I.G.J. Classen, et al., *Multi-wavelength imaging of atomic and molecular emission processes in fusion reactor MAST-U*, Poster P08.025
5. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, M. Morbey, T.W. Morgan, *Determination of retention levels during lithium and deuterium co-deposition in Magnum-PSI*, Poster P08.022
6. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, F. Romano, V. Tanke, J. Schartz, S. Brons, R. Goldston, T.W. Morgan, *Lithium vapour box design for experimental campaign in linear plasma generator Magnum-PSI*, Poster P08.021
7. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, R. Timmer, W. Arnold Bik, M.J. van de Pol, H.J.N. van Eck, *Design of a steering magnet for ion beam steering inside a linear plasma generator*, Poster P08.013
8. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, M. Hamed, M.J. Pueschel, J. Citrin, *Microtearing turbulence and reduced transport model building in H-mode plasmas*, Poster P08.007
9. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, J. Gonzalez, R. Chandra, T.W.J. Driessen, H.J. de Blank, E. Westerhof, *Simulating Magnum-PSI with SOLPS-ITER: from linear device to tokamak*, Poster P08.006
10. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, P. Mulholland, B.J. Faber, I.J. McKinney, M.J. Pueschel, J.H.E. Proll, K. Aleynikova, *Electromagnetic turbulence in 3D geometry*, Poster P08.017
11. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, M.J. Pueschel, J.M. Duff, J. Ball, *Saturation physics in negative- and positive-triangularity plasmas*, Oral O5.103
12. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, P. Costello, J.H.E. Proll, G.G. Plunk, M.J. Pueschel, *The universal instability in optimised stellarators*, Poster P1b.120
13. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, P. Mulholland, K. Aleynikova, B.J. Faber, I.J. McKinney, M.J. Pueschel, J.H.E. Proll, *KBM and finite-B ITG turbulence in the Wendelstein 7-X stellarator*, Poster P1b.116
14. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, M. Hamed, M.J. Pueschel, J. Citrin, *Microtearing turbulence and reduced transport model building in H-mode plasmas*, Poster P2a.102
15. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, S. Gabriellini, V.K. Zotta, L. Garzotti, C. Bourdelle, F.J. Casson, J. Citrin, D. Frigione, R. Gatto, M. Marin, E. Giovannozzi, et al., *Neon seeding effects on two JET high performance baseline plasmas*, Poster P2a.114
16. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, L. Kogan, D. Ryan, S. Gibson, J. Berkery, S.A. Sabbagh, T. Farley, P. Ryan, K. Verhaegh, B. Kool, T.A. Wijkamp, et al., *First MAST-U equilibrium reconstructions using the EFIT++ Code*, Poster P2a.116
17. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, J.H. Slief, R.J.R. van Kampen, M.W. Brookman, M. van Berkel, *Quantifying electron cyclotron power deposition broadening in DIII-D*, Poster P4b.102

18. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, J. Gonzalez, G.F. Nallo, E. Westerhof, *Self-consistent simulation of Magnum-PSI target in SOLPS-ITER with a Finite Element Wall model*, Poster P4b.112
19. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, J. Gonzalez, L. Conde, J.M. Donoso, J.L. Domenech-Garret, M.A. Castillo, *Measurements and kinetic simulations of the Alternative Low Power Hybrid Ion Engine (alphie)*, Oral O3.302
20. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, K. Tanaka, S. Coda, O. Krutkin, P. Blanchard, A. Karpushov, B. Labit, F. Bagnato, L. Martinelli, D. Mykytchuk, A. Perek, et al., *Isotope effects on particle transport in TCV ohmic discharge*, Poster P4b.116
21. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, G.L. Derks, J.P.K.W. Frankemölle, M. van Berkel, J.T.W. Koenders, H. Reimerdes, M. Wensing, E. Westerhof, *Benchmarking DIV1D on SOLPS-ITER simulations of TCV plasmas*, Poster P4b.120
22. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, A. Ho, C. Bourdelle, J.F. Artaud, Y. Camenen, F.J. Casson, J. Citrin, F. Köchl, M. Marin, J. Morales, G. Tardini, et al., *Towards multi-machine large-scale integrated modelling validation*, Poster P5a.117
23. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, J. Barr, T. Madula, L. Zaniszi, A. Ho, J. Citrin, A. Mancini, A. Gopakumar, S. Pamela, JET Contributors, *An active learning pipeline for surrogate models of gyrokinetic turbulence*, Poster P5b.119
24. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, J.T.W. Koenders, A. Perek, C. Galperti, B.P. Duval, O. Fevrier, C. Theiler, M. van Berkel, TCV team, *Systematic design and demonstration of a MIMO gas injection controller for the N-II emission front and line averaged electron density in TCV*, Poster P4b.122
25. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, P.T. Lang, M. van Berkel, W. Biel, T.O.S.J. Bosman, P. David, C. Day, E. Fable, L. Giannone, T. Giegerich, A. Kallenbach, et al., *Real time monitoring of pellet delivery to facilitate burn control in EU-DEMO*, Oral O4.115
26. 48th EPS Conference on Plasma Physics, 2022/06/27- 2022/07/01, Maastricht, Netherlands, K. Verhaegh, B. Lipschultz, J. Harrison, J. Allcock, B. Kool, N. Osborne, P. Ryan, T.A. Wijkamp, A. Williams, J. Clark, et al., *First MAST-U detachment results indicate enhanced role of molecules*, Oral O3.107
27. 59th Culham Plasma Physics Summer School, 2022/07/18-2022/07/28, Culham, UK, B. Kool, A. Parrot, S. Henderson, O. Bardsley, S. Aleiferis, K. Verhaegh, B. Lipschultz, J.S. Allcock, X. Feng, T. Wijkamp, et al., *Detachment control for STEP*, Poster
28. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, J.T.W. Koenders, M. van Berkel, A. Perek, C. Galperti, B. Kool, T. Ravensbergen, B.P. Duval, O. Fevrier, C. Theiler, M. Bernert, et al., *Closed-loop system identification experiments of the C-III emission front response to deuterium fueling in TCV*, Poster P031(G)
29. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, I.G.J. Classen, G.R.A. Akkermans, J. van den Berg, H.J. van der Meiden, J.W.M. Vernimmen, MagnumPSI team, *Effect of plasma-neutral interactions on power dissipation in the linear plasma device Magnum-PSI*, Poster P039(G)
30. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, F. Romano, V. Tanke, J. Scharzt, S. Brons, R. Goldston, T.W. Morgan, *A Lithium vapour box module for principle investigation in the linear plasma generator Magnum-PSI*, Poster P013(G)
31. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, A. Perek, M. Wensing, K. Verhaegh, B.L. Linehan, H. Reimerdes, C. Bowman, M. van Berkel, I.G.J. Classen, B.P. Duval, O. Fevrier, et al., *Quantitative Balmer line analysis of multispectral imaging data to infer 2D maps of edge plasma parameters in TCV*, Poster P255(F)
32. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, M. Morbey, B. Tyburska-Pueschel, W. Arnold Bik, S. Wang, J.H.J. Dalderop, T.W. Morgan, *Determination of retention levels during lithium and deuterium co-deposition in Magnum-PSI*, Poster P303(J)
33. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, H.J. van der Meiden, K. Schutjes, J.W.M. Vernimmen, I.G.J. Classen, R. Engeln, S. Brezinsek, P. Veis, MagnumPSI team, *Active spectroscopy in the linear plasma device Magnum-PSI*, Poster P310(J)
34. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, T.W. Morgan, P. Rindt, J.G.A. Scholte, W. Ou, M. Iafrafi, G. Mazzitelli, S. Rocchella, F.L. Tabares, E. Oyarzabal, D. Alegre, et al., *Development of a tin-based liquid metal divertor for the EU-DEMO*, Poster P342(J)
35. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, M. Bernert, S. Wiesen, O. Fevrier, A. Kallenbach, J.T.W. Koenders, B. Sieglin, B. Kool, A. Perek, M. van Berkel, T. Wijkamp et al., *The X-point radiating regime at ASDEX Upgrade and TCV*, Poster P037(G)

36. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, K. Verhaegh, B. Lipschultz, J.R. Harrison, J.S. Allcock, B. Kool, N. Osborne, P. Ryan, T.A. Wijkamp, G. Williams, T. Biggelaar, et al., *Spectroscopic investigations of the detached MAST-U Super-X divertor*, Oral TO09(G)
37. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, B.L. Linehan, A. Perek, B.P. Duval, J.M. Munoz-Burgos, F. Bagnato, P. Blanchard, C. Collandrea, O. Fevrier, T. Wijkamp, E. Flom, et al., *2D poloidal maps of Te and ne using multi-spectral imaging in detachment and flux expansion studies at TCV*, Poster P251(F)
38. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, J.G.A. Scholte, M. Iafrazi, A.C.A. Delsing, J.H.J. Dalderop, F. Brochard, M. Visser, E. Zoethout, T.W. Morgan, *Reducing tin droplet ejection from capillary porous structures under hydrogen plasma exposure*, Poster P304(J)
39. 25th PSI Conference 2022, 2022/06/12-2022/06/17, Jeju, Korea, R. Rizkallah, T.W. Morgan, et al., *Characterizing the lithium vapor cloud in vapor shielding experiments in Magnum-PSI*, Poster P246(F)
40. 37th International Electric Propulsion Conference (IEPC 2022), 2022/06/19-2022/06/23, Boston, MA, US, J. Gonzalez, L. Conde, J.M. Donoso, J.L. Domenech-Garret, M.A. Castillo, *Thrust measurements and plasma plume kinetics of the alternative low power hybrid ion engine (alphie)*, Oral
41. 44th Scientific Assembly Committee on Space Research (COSPAR 2022), 2022/07/16-2022/07/24, Athens, Greece, J. Gonzalez Munoz, L. Conde, J.M. Donoso, J.L. Domenech-Garret, *The alternative low power ion engine (alphie) for end-of-life disposal of small satellites in low Earth orbit: thrust measurements and plasma plume kinetics*, Oral
42. 21st Joint Workshop on Electron Cyclotron Emission (ECE) and Electron Cyclotron Resonance Heating (ECRH) (EC-21-2020), 2022/06/2020-22/06/24, Cadarache, France, J.H. Slief, R.J.R. van Kampen, M.W. Brookman, J. van Dijk, E. Westerhof, M. van Berkel, *Quantifying electron cyclotron power deposition broadening in DIII-D*, Poster P2.85
43. 31st meeting of ITPA Topical Group SOL and Divertor Physics (DivSOL), 2022/01/29, Online, France, M. van Berkel, J. Koenders, T. Ravensbergen, M. Wensing, A. Perek, TCV team, *Why dynamic measurements are crucial for time-dependent modelling of detachment?*, Oral
44. 9th Runaway Electron Modelling (REM) Meeting 2022, 2022/05/02-2022/05/06, Garching, Germany, T.A. Wijkamp, A. Perek, J. Decker, B. Duval, M. Hoppe, G. Papp, U. Sheikh, I.G.J. Classen, R.J.E. Jaspers, TCV team, et al., *Runaway electron distribution reconstruction using multispectral synchrotron camera imaging in TCV*, Oral May 5th 11:15
45. 26th US-EU Joint Transport Task Force Meeting (TTF 2022), 2022/04/05-2022/04/08, Santa Rosa, CA, US, M.J. Pueschel, J.M. Duff, J. Ball, *Zonal-flow saturation at finite triangularity*, Poster
46. 28th ITPA Transport & Confinement Topical Group Meeting 2022, 2022/04/01, Online, France, M.J. Pueschel, *Nonlinear saturation and profile stiffness at negative and positive triangularity*, Oral
47. 2nd IAEA Technical Meeting (TM) on Plasma Disruptions and their Mitigation, 2022/07/19-2022/07/22, Vienna, Austria, U. Sheikh, J.A. Cazabonne, J. Cerovsky, S. Coda, C. Colandrea, A. Dal Molin, J. Decker, T. Wijkamp, B. Duval, M. Faitsch, et al., *Benign termination of runaway electron beams on ASDEX Upgrade and TCV*, Oral
48. FuseNet PhD Event 2022, 2022/07/04-2022/07/06, Padua, Italy, T. Wijkamp, J.S. Allcock, X. Feng, J. Harrison, B. Kool, B. Lipschultz, A. Perek, R. Sharples, K. Verhaegh, I.G.J. Classen, et al., *Multi-wavelength imaging of atomic and molecular emission processes in the MAST-U divertor*, Poster and Oral Pitch P1
49. FuseNet PhD Event 2022, 2022/07/04-2022/07/06, Padua, Italy, T. Beernaert, M.R. de Baar, M. De Bock, I.G.J. Classen, P. Etman, *A systems approach for plasma modelling*, Poster P1
50. 6th IEEE Conference on Control Technology and Applications CCTA 2022, 2022/08/23-2022/08/25, Trieste, Italy, T.O.S.J. Bosman, M. van Berkel, M.R. de Baar, *Constrained model-predictive control of the electron density profile in ITER using two pellet injectors (I)*, Oral WeB2.1
51. 4th IAEA Technical Meeting (TM) on Divertor Concepts, 2022/11/07-2022/11/10, Vienna, Austria, M. Bernert, S. Wiesen, G. Birkenmeier, M. Dunne, T.O.S.J. Bosman, T. Lunt, T. Gleiter, B. Sieglin, ASDEX Upgrade team, *Entry to and exit from ELM suppressed H-mode in detached conditions*, Oral
52. 11th ITER International School, ITER Plasma Scenarios and Control, 2022/07/25-2022/07/29, San Diego, CA, USA, F. Pastore, F. Felici, T.O.S.J. Bosman, C. Galperti, O. Sauter, B. Vincent, T. Vu, TCV team, *Model-based electron density estimation using multiple diagnostics on TCV*, Poster
53. 32nd Symposium on Fusion Technology (hybrid) SOFT 2022, 2022/09/18-2022/09/23, Dubrovnik, Croatia, S.S. Herashchenko, V. Makhilai, I.E. Garkusha, Y.V. Petrov, N.N. Aksenov, O.V. Byrka, V.V. Cheboratev, N.V. Kulik, V.V. Staltsov, T.W. Morgan, et al., *The CPS's pre-heating effect on the capability to withstand extreme plasma loads*, Poster P-2.321
54. 32nd Symposium on Fusion Technology (hybrid) SOFT 2022, 2022/09/18-2022/09/23, Dubrovnik, Croatia, H.J.N. van Eck, R. Al, S. Alonso van der Westen, S. Brons, I.G.J. Classen, J.A.W. van Dommelen,

- M.G.D. Geers, N.J. Lopes Cardozo, H.J. van der Meiden, C.A. Orrico, et al., *LiMeS-lab: An integrated laboratory for the development of liquid-metal shield technologies for fusion reactors*, Poster P-1.231
55. 32nd Symposium on Fusion Technology (hybrid) SOFT 2022, 2022/09/18-2022/09/23, Dubrovnik, Croatia, M.J. van de Pol, R. Al, S. Alonso van der Westen, W. Arnold Bik, S. Brons, H.J. van der Meiden, W. Melissen, M. Morbey, T.W. Morgan, J. Scholten, et al., *Upgraded Pilot-PSI: a novel research facility to study plasma material interaction by ion beam analysis during high flux plasma exposures*, Poster P-1.240
56. 32nd Symposium on Fusion Technology (hybrid) SOFT 2022, 2022/09/18-2022/09/23, Dubrovnik, Croatia, F. Pastore, T.O.S.J. Bosman, F. Felici, O. Sauter, T. Vu, C. Galperti, TCV team, *Integration of model-based electron density estimation using multiple diagnostics on TCV*, Poster P-2.325
57. 32nd Symposium on Fusion Technology (hybrid) SOFT 2022, 2022/09/18-2022/09/23, Dubrovnik, Croatia, P. Lang, T.O.S.J. Bosman, C. Day, T. Giegerich, M. Kircher, O. Kudlacek, M. Maraschek, G. Phillips, B. Ploeckl, B. Sieglin, et al., *Concept for a multi-purpose EU-DEMO pellet launching system*, Poster P-1.71
58. FuseNet PhD Event 2022, 2022/07/04-2022/07/06, Padua, Italy, P. Mulholland, K. Aleynikova, B.J. Faber, I.J. McKinney, M.J. Pueschel, J.H.E. Proll, *KBM and Finite- $\beta$  ITG Turbulence in the Wendelstein 7-X stellarator*, Poster and Oral Pitch P1
59. Meeting of ITPA Diagnostics Topical Group (DG), 2022/10/12, Cadarache, France, M.R. de Baar, T. Beernaert, P. Etman, M. van Berkel, *Network model for plasma control system (RT SWG report)*, Oral
60. 30th Workshop of the European Research Network on System Identification ERNSI 2022, 2022/09/25-2022/09/28, Leuven, Belgium, J.T.W. Koenders, M. van Berkel, TCV team, *System identification for exhaust control in the research fusion reactor TCV*, Poster 21
61. 30th Workshop of the European Research Network on System Identification ERNSI 2022, 2022/09/25-2022/09/28, Leuven, Belgium, M. van Berkel, R.J.R. van Kampen, H. Zwart, S. Weiland, M.R. de Baar, *Estimating space-dependent coefficients for n-dimensional transport in the frequency domain*, Poster 47
62. 7th International Symposium on Liquid metals Applications for Fusion ISLA-7 2022, 2022/12/12-2022/12/16, Chubu, Japan, F. Romano, T.W. Morgan, *A lithium vapour box module design for experiments in the linear plasma generator Magnum-PSI*, Oral Day3-Session5
63. 7th International Symposium on Liquid metals Applications for Fusion ISLA-7 2022, 2022/12/12-2022/12/16, Chubu, Japan, T.W. Morgan, *An integrated laboratory for the development of liquid-metal shield technologies for fusion reactors*, Oral Day3-Session4
64. 7th International Symposium on Liquid metals Applications for Fusion ISLA-7 2022, 2022/12/12-2022/12/16, Chubu, Japan, J.G.A. Scholte, T.W. Morgan, *Performance of a liquid tin divertor target during ASDEX Upgrade Land H-mode operation*, Oral Day2-Session2
65. 7th International Symposium on Liquid metals Applications for Fusion ISLA-7 2022, 2022/12/12-2022/12/16, Chubu, Japan, M. Morbey, T.W. Morgan, *Deuterium retention in Li-D co-deposits in Magnum-PSI and comparison with SOLPS-ITER*, Oral Day4-Session7
66. 64th Annual Meeting of the APS Division of Plasma Physics, 2022/10/17-2022/10/21, Spokane, WA, USA, M.J. Pueschel, J. Ball, J.M. Duff, S. Coda, *Turbulence and transport in negative and positive triangularity*, Oral
67. 30th Meeting of ITPA Integrated Operation Scenarios Topical Group (IOS), 2022/11/09, Cadarache, France, M. van Berkel, T.O.S.J. Bosman, F. Koechl, D. van Elk, J.T.W. Koenders, M.R. de Baar, P.T. Lang, *Development of core plasma density feedback control necessary using fueling pellets?*, Oral
68. IAEA Technical Meeting on Long-Pulse Operation of Fusion Devices, 2022/11/15, Cadarache, France, M. van Berkel, T.O.S.J. Bosman, F. Koechl, D. van Elk, J.T.W. Koenders, M.R. de Baar, P.T. Lang, *Development of core plasma density feedback control necessary using fueling pellets?*, Oral
69. 32nd meeting of ITPA Topical Group SOL and Divertor Physics (DivSOL), 2022/10/28, Caderache, France, J. Koenders, M. van Berkel, T.O.S.J. Bosman, L. Ceelen, *Dynamics and control of the heat-exhaust in TCV, AUG and DIII-D*, Oral
70. FuseNet Master Event 2022, Parallel talks, Science and engineering, 2022/11/22, Online, Eindhoven, Netherlands, A. Ho, *The complexity of modelling a tokamak plasma*
71. DEMO Technical Workshop, 2022/12/07, Garching, Germany, J. Koenders, M. van Berkel, *Strategy towards reactor relevant model-based predictive exhaust control and evaluation for DEMO*, Oral
72. 61st IEEE Conference on Decision and Control, 2022/12/06-2022/12/09, Cancun, Mexico, R.J.R. van Kampen, M. van Berkel, H. Zwart, *Estimating space-dependent coefficients for 1D transport using gaussian processes as state estimator in the frequency domain*, Oral



### 1.10 Positions: 26

1. M.R. de Baar, Member of the Fusion for Energy (F4E) Governing Board (since 2019), 2022
2. M.R. de Baar, Member executive board of ITER-NL consortium (since 2014) and program leader for the MHD stabilization work package, 2022
3. M.R. de Baar, Member of the Advisory Board FONTYS Applied Natural Sciences (since 2018), 2022
4. M.R. de Baar, Professor at Eindhoven University of Technology (since 2012), 2022
5. T.W. Morgan, Associate Professor Eindhoven University of Technology (since 2019), 2022
6. T.W. Morgan, Member Scientific Programme Committee International Conference on Plasma-Facing Materials and Components for Fusion Applications PFMC (since 2019), 2022
7. B. Tyburska-Pueschel, Member Euratom Scientific and Technical Committee (since 2020), 2022
8. M.J. Pueschel, Member Theory Project Board, EUROfusion Fusion Science Department, 2022
9. M.J. Pueschel, Member ITPA Transport and Confinement Topical Group, 2022
10. M.J. Pueschel, Member U.S. National Stellarator Coordinating Committee (since 2017), 2022
11. M.J. Pueschel, Member NWO advisory committee Physics of Fluids and Soft Matter (since 2021), 2022
12. M.J. Pueschel, Lecturer at Ruhr University Bochum, Germany (since 2021), 2022
13. J. Citrin, Associate Professor Eindhoven University of Technology (since 2019), 2022
14. J. Citrin, Member Writing committee NWO Roadmap National Strategic Agenda for Computational Sciences (NACS), 2022
15. M.J. Pueschel, Lecturer at Eindhoven University of Technology (since 2021), 2022
16. H.J. de Blank, Lecturer Course series at Eindhoven University of Technology (since 2015), 2022
17. E. Westerhof, Chair Local Organizing Committee 48th European Conference on Plasma Physics EPS 2022, June 27-July 1, Online, Maastricht, Netherlands, 2022
18. J. Citrin, Member Programme Committee 48th European Conference on Plasma Physics EPS 2022, June 27-July 1, Online, Maastricht, Netherlands, 2022
19. A.J.H. Donné, Member Coordinating Committee ITER IO-Broader Approach agreement (since 2020), 2022
20. A.J.H. Donné, Member EIROforum Council (member since 2014, chair 2018-2019), 2022
21. A.J.H. Donné, Chair of Coordinating Committee of the International Tokamak Physics Activity (ITPA-CC) (since 2014), 2022
22. A.J.H. Donné, Chair of the International Advisory Committee of EAST (Hefei, China) (since 2019; member since 2015), 2022
23. A.J.H. Donné, Member of the International Scientific Advisory Board (Fachbeirat) of the Max-Planck-Institut for Plasma Physics (2014-2022), 2022
24. A.J.H. Donné, Member International Scientific Committee AAPPS-DPP Conference (Association of Asia Pacific Physical Societies) (since 2017), 2022
25. A.J.H. Donné, Member of the International Advisory Board of the Institute of Solid State Physics, University of Latvia (ISSP-UL) (since 2022), 2022
26. A.J.H. Donné, Member IFMIF-DONES Prep Council (Int. Fusion Materials Irradiation Facility / DEMO Oriented NEutron Source, Granada) (2020-2022), 2022

### 1.11 Public events and industry contacts: 13

1. NEVAC Dag 2022, lezing NEVAC-prijzen, 2022/04/13, Leiden, Netherlands, J. Koenders, *Actieve regeling van de warmteafvoer in een kernfusiereactor*
2. Big Science and Knowledge Transfer (ILO-net en Mikrocentrum), 2022/06/17, Veldhoven, Netherlands, M.R. de Baar, *DIFFER science valorization. Examples of co-evolution, technology transfer, and spin-outs. With special focus on fusion energy*
3. Nuclear Energy Ecosystems - Open Business Day 2022 Building nuclear energy future together, 2022/05/03-2022/05/04, Helsinki, Finland, A.J.H. Donné, *The big picture in nuclear energy*
4. Starmus VI: 50 Years on Mars, 6th festival 2022, 2022/09/05-2022/09/10, Yerevan, Armenia, A.J.H. Donné, *Fusion: creating a star on Earth*
5. Starmus VI: 50 Years on Mars, 6th festival 2022, 2022/09/05-2022/09/10, Yerevan, Armenia, A.J.H. Donné, *Challenges on the path towards fusion electricity*
6. Starmus VI: 50 Years on Mars, 6th festival 2022, 2022/09/05-2022/09/10, Yerevan, Armenia, A.J.H. Donné, *Panel discussion on ethics in science*
7. 32nd Symposium on Fusion Technology (hybrid) SOFT 2022, 2022/09/18-2022/09/23, Dubrovnik, Croatia, C. Baylard, G. Federici, G. Gagmano, M. Porto, A.J.H. Donné, *Role of industry in EU fusion research*

8. ChangeNOW Summit 2022, 2022/09/19-2022/09/21, Paris, France, A.J.H. Donné, *How does Nuclear Fusion fit in the CO<sub>2</sub> transition?*
9. Big Science Business Forum 2022, 2022/10/04-2022/10/08, Granada, Spain, A.J.H. Donné, *Why do we need IFMIF-DONES?*, Parallel Session B2
10. European Fusion Teacher Day 2022, Dutch local program, 2022/10/14, Eindhoven, Netherlands, M. van Berkel, *Regelen van de uitlaat en kern van kernfusiereactor*
11. Panel discussion at Fusion22 conference, 2022/10/18, Hybrid, London, UK, A.J.H. Donné, *Fusion, fairness and justice*
12. FrontierDAO Workshop on democratization of energy, 2022/11/17, Online, USA, A.J.H. Donné, *Fusion energy as a climate solution*
13. TEDx Cesena Event 2022, 2022/11/30, Cesena, Italy, A.J.H. Donné, *Fusion from science fiction to science fact*

#### 1.12 Awards: 1

1. J. Koenders, NEVAC-Prize 2022 for Best Paper in NEVAC Blad, Volume 59/2021, 2022/04/13

#### 1.13 Media appearances: 55

1. Donuts, appels, zuigers en rugbyballen. Alternatieve wegen naar kernfusie, Ingenieur, de, 2022/01, Interview with M. de Baar, A.J.H. Donné
2. DIFFER en TU/e werken aan nieuw röntgenlab voor materiaalonderzoek, Engineer.net, 2022/01/25, General coverage
3. TU/e en DIFFER gaan werken aan een 'nationaal röntgenlab', ED, 2022/01/26, General coverage
4. TU/e en DIFFER gaan nationaal röntgenlab oprichten, Studio040, 2022/01/26, General coverage
5. Röntgenlab voor materiaalonderzoek in de maak, Maakindustrie.nl, 2022/01/31, Interview with M. de Baar
6. Landelijk Kernfusie-expert: energie uit wind en zon blijft hard nodig, Nieuws.nl, 2022/01/28, Interview with M. de Baar
7. Kernfusie-expert: energie uit wind en zon blijft hard nodig, Leeuwarder Courant, 2022/01/28, Interview with M. de Baar
8. Deeltjes tasten in het duister / Particles in the dark, NWO Resultaat, 2022/01/28, General coverage
9. Wetenschappers wekken recordhoeveelheid energie op met kernfusie, Nu.nl, 2022/02/09, General coverage
10. Record aan energie opgewekt met kernfusie, alledaags gebruik nog ver weg, NOS, 2022/02/09, General coverage
11. Belangrijke stap in kernfusie-experiment, BNR Wetenschap vandaag, 2022/02/09, Interview with E. Westerhof
12. Grote doorbraak in kernfusie: de heilige graal van energie, RTL nieuws, 2022/02/09, Interview with M. de Baar
13. Recordhoeveelheid energie opgewekt met Europees experiment kernfusie, NRC.nl, 2022/02/09, General coverage
14. 'Een blijde dag voor kernfusie': fysici verdubbelen 25 jaar oud energierecord, Volkskrant.nl, 2022/02/09, Interview with E. Westerhof
15. Voorganger van kernfusiereactor ITER vestigt nieuw record, De Ingenieur.nl, 2022/02/09, General coverage
16. Kernfusiereactor wekt recordhoeveelheid energie op, Kijkmagazine.nl, 2022/02/09, Interview with E. Westerhof, T. Donné
17. Fusion energy record blasted in JET, BBC News, 2022/02/09, Interview with A.J.H. Donné
18. Why is the participation of Switzerland important within ITER?, Swiss national broadcast SRF daily news show Tagesschau, 2022/02/09, Interview with A.J.H. Donné
19. Record aan energie opgewekt met kernfusie, NOS Nieuwsuur, 2022/02/10, Interview with E. Westerhof, T. Morgan
20. Op welke termijn kan kernfusie daadwerkelijk energie gaan leveren?, NOS Met het Oog op Morgen, 2022/02/10, General coverage
21. Fusion energy record blasted in JET, BBC Radio 4 Inside Science, 2022/02/10, Interview with A.J.H. Donné

22. Fusion milestone, Fusion energy record blasted in JET, BBC World Service, Science in Action, 2022/02/10, Interview with A.J.H. Donné
23. Kernfusie is veelbelovend, maar komt voor de klimaatcrisis te laat, Nu.nl, 2022/02/11, Interview with J. Citrin
24. Breakthrough results in fusion, CNN Newsroom with Pamela Brown, 2022/02/13, Interview with A.J.H. Donné
25. Record fusion performance of JET, US Public Radio, The World, 2022/02/14, Interview with A.J.H. Donné
26. World record fusion energy generation, CNN Newsroom with Elisabeth Wells, 2022/02/21, Interview with A.J.H. Donné
27. Noord-Brabant wil bedrijven kansen bieden op vlak van kernenergie, Trouw, 2022/03/18, General coverage
28. Noord-Brabant investeert in onderzoek naar technologie voor kernenergie, Studio 040, 2022/03/18, Interview with B. Tyburska-Pueschel
29. Brabant investeert in ontwikkeling thoriumcentrale, Energiea, 2022/03/18, Interview with M. de Baar
30. Bijna 9 ton voor kernenergie, ED, BD, BN De Stem, Omroep Brabant, Studio040 (via ANP), 2022/03/18, General coverage
31. Hoe krijg je 'n reactorwand roestvrij?, ED, 2022/03/24, Interview with M. de Baar, B. Tyburska
32. Wat als we vol inzetten op kernenergie?, BNR, 2022/04/12, Interview with M. de Baar
33. Jesse Koenders vertelt over zijn werk en over vacuüm bij kernfusie, Sleutelstad (Leiden), 2022/04/13, Interview with J. Koenders
34. Hoe haalbaar is de energietransitie?, NPO Radio 1, Jortcast Grand Tour, 2022/04/23, Interview with M. de Baar
35. Zes TU/e-onderzoekers slepen elk 800.000 euro in de wacht voor onderzoek. Zonder waterstof geen kernfusiereactor, ED, 2022/07/01, Interview with M. van Berkel
36. Kernfusie geslaagd (en ook mislukt), NOS Radio 1 Nieuwsweekend, 2022/09/03, Interview with M. de Baar
37. China heeft helium-3 op de maan opgegraven, RTL Z, 2022/09/12, Interview with M. de Baar
38. Het energieproject van de toekomst op losse schroeven?, Telegraaf, 2022/09/17, Interview with M. de Baar
39. Beata Tyburska-Pueschel - Young professionals in the nuclear field, EU Science & Innovation, 2022/10/06, Interview with B. Tyburska
40. Prospects of Fusion, Science not Fiction series by the European Liberal Forum, 2022/10/06, Interview with A.J.H. Donné
41. Building a star on earth: the future of nuclear fusion, Podcast: The Project by the Project Finance Institute, 2022/10/10, Interview with A.J.H. Donné
42. 'Enorme doorbraak' in onderzoek kernfusie, BNR Nieuwsradio, 2022/12/12, Interview with M. de Baar
43. Fusion Energy for all Humanity, Ira S. Pastor Podcast: Progress, potential, and possibilities. Discussions with fascinating people designing a better tomorrow, 2022/12/12, Interview with A.J.H. Donné
44. Kernfusie wekt eindelijk meer energie op dan het kost. Doorbraak of niet?, de Volkskrant, 2022/12/13, Interview with M. de Baar
45. "Het zijn minibomtestjes, die met computers worden uitgewerkt", BNR, 2022/12/13, Interview with M. de Baar
46. Amerikaanse doorbraak in kernfusie-onderzoek, NRC, 2022/12/13, Interview with M. de Baar
47. VS bejubelen mijlpaal op gebied van kernfusie, De Telegraaf, 2022/12/13, Interview with M. de Baar
48. VS bereikt mijlpaal voor kernfusie, maar er wachten nog grote uitdagingen, Nu.nl, 2022/12/13, Interview with J. Citrin
49. Breakthrough in nuclear fusion: First-ever energy gains achieved, InnovationOrigins (EN), 2022/12/13, Interview with M. de Baar
50. Take claims of nuclear fusion breakthroughs with a grain of salt, Dutch expert says, NL Times (via ANP), 2022/12/13, Interview with M. de Baar
51. Doorbraak in onderzoek: kernfusie als energiebron stap dichterbij, NOS, 2022/12/13, General coverage
52. VS bereiken mijlpaal op gebied kernfusie. Commerciële toepassing nog onduidelijk, Leeuwarder Courant, 2022/12/14, Interview with M. de Baar
53. Ondanks doorbraak blijft fusie-energie voorlopig toekomstmuziek, Reformatorisch Dagblad, 2022/12/14, Interview with M. de Baar
54. Voor het eerst levert kernfusie meer energie op dan erin gaat, De Ingenieur, 2022/12/14, Interview with E. Westerhof
55. Vijf vragen over de 'kernfusiedoorbraak' in de VS, KIJK, 2022/12/14, General coverage

## 2 Scientific Output DIFFER Solar Fuels in 2022

### 2.1 PhD theses: 5

1. M.C. Sorkun, *Artificial Intelligence-driven discovery of materials for energy applications*, PhD thesis at the Eindhoven University of Technology, 2022/06/01, Promotors: J.M.V.A. Koelman, M.R. de Baar; Co-promotor: S. Er
2. Q. Ong, *Vibrational excitement: mode-selective conversion of CO<sub>2</sub>*, PhD thesis at the Eindhoven University of Technology, 2022/06/14, Promotors: G.J. van Rooij, M.C.M. van de Sanden
3. X. Zhou, *High-throughput computational screening of organic molecules for organic ion battery cathodes*, PhD thesis at the Eindhoven University of Technology, 2022/11/09, Promotor: R.A.J. Janssen; Co-promotor: S. Er
4. R.F. Hamans, *Plasmonic fields at work*, PhD thesis at the VU University, 2022/03/14, Promotor: A. Baldi; Co-promotor: E.L. von Hauff
5. A.W. van de Steeg, *Insight into CO<sub>2</sub> dissociation kinetics in microwave plasma using laser scattering*, PhD thesis at the Eindhoven University of Technology, 2022/03/01, Promotors: G.J. van Rooij, M.C.M. van de Sanden

### 2.2 Master thesis & Bachelor thesis: 3

1. V. Anirhudan, *Microkinetic modelling of oxygen evolution reaction: nonlinear vs. equivalent circuit modelling*, Master thesis Eindhoven University of Technology, 2022/01/31, Mentors: A. Bieberle-Hütter, M. van Berkel, B.F.H. van den Boorn, M.R. de Baar,
2. E. Overvelde, *Effect of Bi/Fe stoichiometry in BiFeO<sub>3</sub> on photo-electrochemical water splitting*, Bachelor thesis Fontys University for Applied Sciences, 2022/01/31, Mentors: A. Bieberle-Hütter, N. Puthuval Prasad
3. T.J. Dorst, *Quantifying a low pressure radio frequency nitrogen plasma using optical emission spectroscopy*, Bachelor thesis Utrecht University, 2022/01/16, Mentor: M.C.M. van de Sanden

### 2.3 Publications in peer-reviewed scientific journals: 41

1. H.Y. Ma, R.K. Sharma, S. Welzel, M.C.M. van de Sanden, M.N. Tsampas, W. Schneider, *Observation and rationalization of nitrogen oxidation enabled only by coupled plasma and catalysts*, Nat. Commun. 13 (2022) 402
2. B.T. Feleki, R.K.M. Bouwer, M.M. Wienk, R.A.J. Janssen, *Perovskite solar cells on polymer-coated smooth and rough steel substrates*, Sol. RRL 6 (2022) 2100898
3. B.T. van Gorkom, T.P.A. van der Pol, K. Datta, M.M. Wienk, R.A.J. Janssen, *Revealing defective interfaces in perovskite solar cells from highly sensitive sub-bandgap photocurrent spectroscopy using optical cavities*, Nat. Commun. 13 (2022) 349
4. K. Datta, J.K. Wang, D. Zhang, V. Zardetto, W.H.M. Remmerswaal, C.H.L. Weijtens, M.M. Wienk, R.A.J. Janssen, *Monolithic all-perovskite tandem solar cells with minimized optical and energetic losses*, Adv. Mater. 34 (2022) 2110053
5. H. Bin, T.P.A. van der Pol, J. Li, B.T. van Gorkom, M.M. Wienk, R.A.J. Janssen, *Efficient organic solar cells with small energy losses based on a wide-bandgap trialkylsilyl-substituted donor polymer and a non-fullerene acceptor*, Chem. Eng. J. 435 (2022) 134878
6. T.P.A. van de Pol, K. Datta, M.M. Wienk, R.A.J. Janssen, *The intrinsic photoluminescence spectrum of perovskite films*, Adv. Opt. Mater. 10 (2022) 2102557
7. H.J. Bin, K. Datta, J.K. Wang, T.P.A. van de Pol, J.Y. Li, M.M. Wienk, R.A.J. Janssen, *Finetuning hole-extracting monolayers for efficient organic solar cells*, ACS Appl. Mater. Interfaces 14 (2022) 16497–16504
8. K. George, M. van Berkel, X.Q. Zhang, R. Sinha, A. Bieberle-Hütter, *Correction to 'Impedance spectra and surface coverages simulated directly from the electrochemical reaction mechanism: a nonlinear state space approach, 2019'*, J. Phys. Chem. C 126 (2022) 10947–10948
9. R.R. Jacquemond, C.T.C. Wan, Y.M. Chiang, Z. Borneman, F.R. Brushett, K. Nijmeijer, A. Forner-Cuenca, *Microstructural engineering of high-power redox flow battery electrodes via non-solvent induced phase separation*, Cell Rep. Phys. Sci. 3 (2022) 100943
10. B.T. Feleki, R.K. M. Bouwer, V. Zardetto, M.M. Wienk, R.A.J. Janssen, *p-i-n perovskite solar cells on steel substrates*, ACS Appl. Energy Mater. 5 (2022) 6709–6715



11. J.D. Butson, A. Sharma, H.J. Chen, Y. Wang, Y. Lee, P. Varadhan, M.N. Tsampas, C. Zhao, A. Tricoli, H.H. Tan, et al., *Surface-structured cocatalyst foils unraveling a pathway to high-performance solar water splitting*, *Adv. Energy Mater.* 12 (2022) 2102752
12. I. Adamovich, S. Agarwal, E. Ahedo, L.L. Alves, S.D. Baalrud, N. Babaeva, A. Bogaerts, A. Bourdon, P.J. Bruggeman, M.C.M. van de Sanden, et al., *The 2022 plasma roadmap: low temperature plasma science and technology*, *J. Phys. D: Appl. Phys.* 55 (2022) 373001
13. C.J. Weststrate, D. Garcia Rodriguez, D. Sharma, H.O.A. Fredriksson, *Structure-dependent adsorption and desorption of hydrogen on FCC and HCP cobalt surfaces*, *J. Catal.* 405 (2022) 303-312
14. R. Olleary, A. Caiazza, J.Y. Li, M. Fattori, A.J.J.M. van Breemen, M.M. Wienk, G.H. Gelinck, R.A.J. Janssen, *Multidimensional perovskites for high detectivity photodiodes*, *Adv. Mater.* 34 (2022) 2205261
15. R.R. Jacquemond, R. Geveling, A. Forner-Cuenca, K. Nijmeijer, *On the characterization of membrane transport phenomena and ion exchange capacity for non-aqueous redox flow batteries*, *J. Electrochem. Soc.* 169 (2022) 080528
16. N. Daub, K.H. Hendriks, R.A.J. Janssen, *Two-electron tetrathiafulvalene catholytes for nonaqueous redox flow batteries*, *Batteries Supercaps.* 5 (2022) e202200386
17. S.Y. Feng, S. Kajita, M. Higashi, A. Bieberle-Hütter, T. Yoshida, N. Ohno, *Photoelectrochemical properties of plasma-induced nanostructured tungsten oxide*, *Appl. Surf. Sci.* 580 (2022) 151979
18. T.P.A. van de Pol, K. Datta, M.M. Wienk, R.A.J. Janssen, *Impact of self-absorption and cavity effects on the electroluminescence spectra of thin-film solar cells*, *Sol. RRL* 6 (2022) 2200872
19. A. Pandiyan, V. Kyriakou, D. Neagu, S. Welzel, A.P.H. Goede, M.C.M. van de Sanden, M.N. Tsampas, *CO<sub>2</sub> conversion via coupled plasma-electrolysis process*, *J. CO<sub>2</sub> Util.* 57 (2022) 101904
20. Y. Liang, A. Bieberle-Hütter, G. Brocks, *Anti-Ferromagnetic RuO<sub>2</sub>: A Stable and Robust OER Catalyst over a Large Range of Surface Terminations*, *J. Phys. Chem. C* 126 (2022) 1337-1345
21. D. Garcia Rodriguez, M.A. Gleeson, J.V. Lauritsen, Z.S. Li, X. Yu, J.W. Niemantsverdriet, C.J. Weststrate, *Iron carbide formation on thin iron films grown on Cu(100): FCC iron stabilized by a stable surface carbide*, *Appl. Surf. Sci.* 585 (2022) 152684
22. Q. Zhang, A. Khetan, E. Sorkun, F. Niu, A. Loss, I. Pucher, S. Er, *Data-driven discovery of small electroactive molecules for energy storage in aqueous redox flow batteries*, *Energy Storage Mater.* 47 (2022) 167-177
23. A.W. van de Steeg, L. Vialletto, A.F. Sovelas da Silva, P. Viegas, P. Diomedede, M.C.M. van de Sanden, G.J. van Rooij, *The chemical origins of plasma contraction and thermalization in CO<sub>2</sub> microwave discharges*, *J. Phys. Chem. Lett.* 13 (2022) 1203-1208
24. J. Bucalossi, J. Achard, O. Agullo, T. Alarcon, L. Allegreti, H. Ancher, G. Antar, S. Antusch, V. Anzallo, G.J. van Rooij, et al., *Operating a full tungsten actively cooled tokamak: overview of WEST first phase of operation*, *Nucl. Fusion* 62 (2022) 042007
25. L. Vialletto, A.W. van de Steeg, P. Viegas, S. Longo, G.J. van Rooij, M.C.M. van de Sanden, J. van Dijk, P. Diomedede, *Charged particle kinetics and gas heating in CO<sub>2</sub> microwave plasma contraction: comparisons of simulations and experiments*, *Plasma Sources Sci. Technol.* 31 (2022) 055005
26. F. Chang, I. Tezsevin, J. de Rijk, J.D. Meeldijk, J.P. Hofmann, S. Er, P. Ngene, P.E. de Jongh, *Potassium hydride-intercalated graphite as an efficient heterogeneous catalyst for ammonia synthesis*, *Nat. Catal.* 5 (2022) 222-230
27. V.V. Medvedev, N.N. Novikova, E. Zoethout, *Salisbury screen with lossy nonconducting materials: Way to increase spectral selectivity of absorption*, *Thin Solid Films* 751 (2022) 139232
28. F. Verdelli, J.J.P.M. Schulpen, A. Baldi, J. Gomez Rivas, *Chasing vibro-polariton fingerprints in infrared and Raman spectra using surface lattice resonances on extended metasurfaces*, *J. Phys. Chem. C* 126 (2022) 7143-7151
29. B. Samanta, A. Morales-Garcia, F. Illas, N. Goga, J.A. Anta, S. Calero, A. Bieberle-Hütter, F. Libisch, A.B. Muñoz-García, M. Pavone, et al., *Challenges of modeling nanostructured materials for photocatalytic water splitting*, *Chem. Soc. Rev.* 51 (2022) 3794-3818
30. F. Girard-Sahun, O. Biondo, G. Trenchev, G.J. van Rooij, A. Bogaerts, *Carbon bed post-plasma to enhance the CO<sub>2</sub> conversion and remove O<sub>2</sub> from the product stream*, *Chem. Eng. J.* 442 (2022) 136268
31. R.F. Hamans, M. Parente, A. Garcia-Etxarri, A. Baldi, *Optical properties of colloidal silver nanowires*, *J. Phys. Chem. C* 126 (2022) 8703-8709
32. M.C. Sorkun, D. Mullaj, J.M.V.A. Koelman, S. Er, *ChemPlot, a Python library for chemical space visualization*, *Chem. Methods* 2 (2022) e202200005
33. V. Guerra, T. Silva, N. Pinhao, O. Guaitella, C. Guerra-Garcia, F.J.J. Peeters, M.N. Tsampas, M.C.M. van de Sanden, *Plasmas for in-situ resource utilization on Mars: fuels, life-support and agriculture*, *J. Appl. Phys.* 132 (2022) 070902

34. R. Krebbers, N. Liu, K.E. Jahromi, M. Nematollahi, O. Bang, G. Woyessa, C.R. Petersen, G.J. van Rooij, F.J.M. Harren, A. Khodabakhsh, *Mid-infrared supercontinuum-based Fourier transform spectroscopy for plasma analysis*, *Sci. Rep.* 12 (2022) 9642
35. O. Biondo, C. Fromentin, T. Silva, V. Guerra, G.J. van Rooij, A. Bogaerts, *Insights into the limitations to vibrational excitation of CO<sub>2</sub>: validation of a kinetic model with pulsed glow discharge experiments*, *Plasma Sources Sci. Technol.* 31 (2022) 074003
36. U. Mushtaq, S. Welzel, R.K. Sharma, M.C.M. van de Sanden, M.N. Tsampas, *Development of electrode-supported proton conducting solid oxide cells and their evaluation as electrochemical hydrogen pumps*, *ACS Appl. Mater. Interfaces* 14 (2022) 38938–38951
37. A. Touni, X. Liu, X. Kang, C. Papoulia, E. Pavlidou, D. Lambropoulou, M.N. Tsampas, A.E. Chatzidakis, S. Sotiropoulos, *Methanol oxidation at platinum coated black titania nanotubes and Titanium felt electrodes*, *Molecules* 27 (2022) 6382
38. Q. Zhang, A. Khetan, E. Sorkun, S. Er, *Discovery of aza-aromatic analytes for aqueous redox flow batteries via high-throughput screening*, *J. Mater. Chem. A* 10 (2022) 22214–22227
39. M. Altin, L. Vialetto, A.W. van de Steeg, P. Viegas, S. Longo, G.J. van Rooij, P. Diomede, *Energy partitioning in N<sub>2</sub> microwave discharges: integrated Fokker-Planck approach to vibrational kinetics and comparison with experiments*, *Plasma Sources Sci. Technol.* 31 (2022) 104003
40. F.M. Sapountzi, M. Lavorenti, W.L. Vrijburg, S. Dimitriadou, B. Tyburska-Püschel, P. Thune, J.W. Niemantsverdriet, T.V. Pfeiffer, M.N. Tsampas, *Spark ablation for the fabrication of PEM water electrolysis catalyst-coated membranes*, *Catal.* 12 (2022) 1343
41. E. Sorkun, Q. Zhang, A. Khetan, M.C. Sorkun, S. Er, *RedDB, a computational database of electroactive molecules for aqueous redox flow batteries*, *Nat. Sci. Data* 9 (2022) 718

#### 2.4 Publications in other journals and conference proceedings: 4

1. F.M.A. Smits, W.A. Bongers, F.J.J. Peeters, C.F.A.M. van Deursen, M.C.M. van de Sanden, *Efficiency and conversion optimisation of tubular vortex flow stabilised microwave plasma reactors*, *Proceedings 48th EPS Conference on Plasma Physics* (2022) 560 OA
2. B.F.H. van den Boorn, A. Bieberle-Hütter, M. van Berkel, *Global sensitivity analysis of a microkinetic model of the oxygen evolution reaction*, *Book of Abstracts 41st Benelux Meeting on Systems and Control* (2022) 68 OA
3. R. Krebbers, N. Liu, K.E. Jahromi, M. Nematollahi, O. Bang, G. Woyessa, C.R. Petersen, G.J. van Rooij, F.J.M. Harren, A. Khodabakhsh, et al., *Mid-infrared broadband spectroscopy for plasma analysis*, *Technical Digest Optical Sensors and Sensing Congress 2022* (2022) ETu4H.4
4. F.M.A. Smits, W.A. Bongers, F.J.J. Peeters, C.F.A.M. van Deursen, M.C.M. van de Sanden, *Efficiency and conversion optimisation of tubular vortex flow stabilised microwave plasma reactors*, *Proceedings Europhysics Conference on Atomic and Molecular Physics of Ionized Gases 2022* (2022) 296 , 2022/07/23

#### 2.5 Professional publications, including patents: 2

1. A.P.H. Goede, *CO<sub>2</sub> conversion via coupled plasma-electrolysis process*, *Eur. Phys. News* 53 (2022) 9
2. H. Johnson, K. Sachin, M. Tsampas, G. Zafeiropoulos, *Photoelectrochemical device for the capture, concentration and collection of atmospheric carbon dioxide*, EP4071274; US20220323900; JP2022161022; CN115198300 (EP, 2022/12/10)

#### 2.6 Open software and Databases: 2

1. M.C. Sorkun, D. Mullaj, J.M.V.A. Koelman, S. Er, *ChemPlot. Python library and web application for chemical space visualization*, [www.amdlab.nl/reddb](http://www.amdlab.nl/reddb), 2022/07/01
2. E. Sorkun, Q. Zhang, A. Khetan, M.C. Sorkun, S. Er, *RedDB. A computational database of electroactive molecules for redox flow batteries*, [www.amdlab.nl/chemplot](http://www.amdlab.nl/chemplot), 03/16/2022

#### 2.7 Invited lectures at conferences and meetings: 18

1. Physics Veldhoven 2022, Parallel session Plasma in catalysis: Synergy, symbiosis or antagonism?, 2022/01/25-2022/01/26, Veldhoven, Netherlands, M.N. Tsampas, R. Sharma, S. Welzel, M.C.M. van de

- Sanden, *Synergistic combination of plasma activation and electrocatalysis for nitrogen fixation by water*, FT07.3
2. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, G.J. van Rooij, *Non-equilibrium plasma opportunities for catalysis*, FT07.2
  3. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, V. Guerra, C. Fromentin, T. Silva, A.S. Morillo, L. Vialetto, *Nonequilibrium kinetics in CO<sub>2</sub> plasmas*, FT07.1
  4. International Conference on Advanced Materials for Innovation and Sustainability (ICAMIS 2022), 2022/02/18-2022/02/19, Online, Hyderabad, India, S. Er, *Automating the virtual exploration of electroactive compounds for efficient energy storage*, Keynote
  5. NanoGe Spring Meeting 2022, 2022/03/07-2022/03/11, Online, Spain, R.A.J. Janssen, *Material and device design for highly efficient organic solar cells*
  6. ACS Spring Meeting 2022 Bonding through Chemistry, 2022/03/20-2022/03/24, San Diego, CA, USA, M.C.M. van de Sanden, F.J.J. Peeters, R. Sharma, S. Welzel, M.N. Tsampas, *Plasma-electrochemical conversion processes using ion conducting membrane: a playground for detailed studies on the role of surface charge and electric fields on plasma-electrocatalytic processes*
  7. CCEr symposium farewell scientific director prof. Vianney Koelman, 2022/03/25, Eindhoven, Netherlands, S. Er, *Artificial Intelligence-enabled exploration of new materials for energy applications*
  8. AMCEL mini symposium 'Out of the Box' 30 jaar Kuria, 2022/04/19, Amsterdam, Netherlands, R.A.J. Janssen, *Spotlights on metal halide perovskites*
  9. 15th International Fischer Symposium IFS 2022, 2022/06/12, Kloster Seeon, Germany, A. Bieberle-Hütter, *Understanding the effect of surface states in photo-electrochemical water oxidation by multiscale modelling*
  10. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, M.C.M. van de Sanden, *Renewable energy driven non-thermal chemistry: Plasma chemistry as the special case*, I1.301
  11. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, P. Diomede, L. Vialetto, P. Viegas, A. van de Steeg, G. van Rooij, M.C.M. van de Sanden, S. Longo, J. van Dijk, *Insight into chemistry and transport in CO<sub>2</sub> microwave discharges through comparisons between simulations and experiments*, I4.302
  12. SPIE Optics and Photonics 2022, 2022/08/21-2022/08/25, San Diego, CA, USA, R.A.J. Janssen, *Thin-film solution-processed multijunction solar cells*, Plenary
  13. 18th International Conference on Plasma Surface Engineering (PSE 2022), 2022/09/12-2022/09/15, Erfurt, Germany, M.C.M. van de Sanden, *Renewable energy driven non-thermal chemistry: Plasma chemistry as the special case*, PL0001
  14. 6th International Workshop on Nano and Biophotonics (IWNBP 2022), 2022/09/25-2022/09/30, Evian, France, R.A.J. Janssen, *Perovskite photodetectors*, Plenary
  15. 2nd e-conversion Conference 2022, 2022/10/04-2022/10/07, Venice, Italy, R.A.J. Janssen, *Multijunction solar cells using perovskite semiconductors*
  16. Materials for Sustainable Development Conference (MAT-SUS 2022), 2022/10/24-2022/10/28, Barcelona, Spain, R.A.J. Janssen, *Material and device design for multijunction perovskite solar cells*
  17. AVS 68th International Symposium and Exhibition, 2022/11/06-2022/11/11, Pittsburgh, PA, USA, F.J.J. Peeters, *Next Generation Birkeland-Eyde: From NH<sub>3</sub> to NO (PSTD Young Investigator Award Talk)*, Invited: PS-ThA-5
  18. Frontier Forum on Advanced Optoelectronic Materials and Devices, Celebrating 70th anniversary of South China University of Technology, 2022/12/02, online, Guangzhou, China, R.A.J. Janssen, *Material and device design for perovskite solar cells and photodetectors*
  19. 5th International Symposium on Plasmas for Catalysis and Energy Materials (ISPCEM) 2022, 2022/07/03-2022/07/07, Liverpool, UK, M.N. Tsampas, *Plasma activated electrolyzers for nitrogen fixation*, Keynote KN-7

## 2.8 Invited seminars: 5

1. Seminar Instituto Superior Técnico, Universidade de Lisboa, 2022/02/04, Lisbon, Portugal, A.W. van de Steeg, *Dissociation Kinetics of CO<sub>2</sub> in Microwave Plasma*
2. AMOLF Colloquium Sustainable Energy Materials 2022, 2022/10/10, Amsterdam, Netherlands, A. Bieberle-Hütter, *Solar Fuels @ DIFFER and beyond*
3. Werkgroep Energie Provinciale Staten Noord-Brabant, 2022/10/22, Den Bosch, Netherlands, M.C.M. van de Sanden, *Waterstof: wat is het en welke rol speelt het in de energietransitie?*

4. EIRES Lunch Lecture 2022, 2022/12/02, Eindhoven, Netherlands, M.N. Tsampas, *Electrochemical membrane reactors for energy applications*
5. Seminar Lectures Aarhus University 2022, 2022/12/09, Aarhus, Denmark, M.N. Tsampas, *Electrochemical membrane reactors for energy applications*

### 2.9 Oral & poster presentations at (international) conferences & meetings: 39

1. Physics Veldhoven 2022 2022/01/25-2022/01/26, Veldhoven, Netherlands, M. Altin, P. Viegas, L. Vialetto, S. Longo, P. Diomedea, *Integrating the Fokker-Planck approach to vibrational kinetics in a N<sub>2</sub> plasma chemistry model*, Poster P08.005
2. Physics Veldhoven 2022, 2022/01/25-2022/01/26, Veldhoven, Netherlands, F. Verdelli, J. Gomez Rivas, A. Baldi, *Vibrational strong coupling via surface lattice resonances in open plasmonic cavities*, Poster P02.004
3. KEROGREEN Winter school Future directions in research on Power-to-X for sustainable chemicals & fuels, 2022/02/10-2022/02/11, Online, Karlsruhe, Germany, M.N. Tsampas, *Synergistic combination of plasma and electrocatalysis for nitrogen fixation by water*, Oral
4. KEROGREEN Winter school Future directions in research on Power-to-X for sustainable chemicals & fuels, 2022/02/10, Online, Karlsruhe, Germany, S. Welzel, *CO<sub>2</sub> plasmolysis in the KEROGREEN process chain: development of a plasma reactor module for CO production*, Oral
5. KEROGREEN Winter school Future directions in research on Power-to-X for sustainable chemicals & fuels, 2022/02/10, Online, Karlsruhe, Germany, A. Goede, *EU Project KEROGREEN: main challenges and first results*, Oral
6. COST Action 18234, Annual meeting Computational water splitting, where we are now and where to go?, 2022/02/14-2022/02/15, Online, Geneva, Switzerland, B.F.H. van den Boorn, M. van Berkel, A. Bieberle-Hütter, *Variance-based global sensitivity analysis: a methodological framework and case study for microkinetic modelling*, Oral
7. ACS Spring Meeting 2022 Bonding through Chemistry, 2022/03/20-2022/03/24, San Diego, CA, USA, V. Kyriakou, R. Sharma, D. Neagu, F.J.J. Peeters, S. Welzel, M.C.M. van de Sanden, M.N. Tsampas, *Plasma driven exsolution for nanoscale functionalization of perovskite oxides*, Oral
8. ARC CBBC Symposium 2022: Greenification in Groningen, 2022/04/21, Groningen, Netherlands, F. Peeters, S. Labeur, C.F.A.M. van Deursen, S. Titlbach, S. Schunk, I. Jevtovikj, K. Ehrhardt, M.C.M. van de Sanden, G.J. van Rooij, N.J. Dam, et al., *Next generation 'Birkeland-Eyde'. Direct oxidation of nitrogen to nitric oxide*, Poster
9. 48th EPS Conference on Plasma Physics, 2022/06/27-2022/07/01, Maastricht, Netherlands, F. Smits, W.A. Bongers, F.J.J. Peeters, C.F.A.M. van Deursen, M.C.M. van de Sanden, *Efficiency and conversion optimisation of tubular vortex flow stabilised microwave plasma reactors*, Oral O1.302
10. 9th Tokyo Conference on Advanced Catalytic Science and Technology (TOCAT9), 2022/07/24-2022/07/29, Fukuoka, Japan, S.Y. Feng, S. Kajita, M. Higashi, A. Bieberle-Hütter, T. Yoshida, N. Ohno, *Photoelectrochemical properties of plasma-induced nanostructured tungsten oxide*, Poster
11. Aarhus Power-to-X Symposium 2022 Uniting Industry and Academia on New Solutions for Carbon-Neutrality, 2022/06/01-2022/06/03, Aarhus, Denmark, U. Mushtaq, R.K. Sharma, S. Welzel, M.C.M. van de Sanden, M.N. Tsampas, *Thermal or electrocatalysis for carbon dioxide valorisation? Development and evaluation of proton conducting solid oxide electrolysis cells for Power-to-X applications*, Poster
12. 25th ESCAMPIG (Europhysics Conference on Atomic and Molecular Physics of Ionized Gases) 2022, 2022/07/19-2022/07/23, Paris, France, F.M.A. Smits, W.A. Bongers, F.J.J. Peeters, C.F.A.M. van Deursen, M.C.M. van de Sanden, *Efficiency and conversion optimisation of tubular vortex flow stabilised microwave plasma reactors*, Poster P334
13. 25th ESCAMPIG (Europhysics Conference on Atomic and Molecular Physics of Ionized Gases) 2022, 2022/07/19-2022/07/23, Paris, France, L. Vialetto, A. van de Steeg, G. van Rooij, P. Diomedea, P. Viegas, *Modelling chemistry and transport in contracted microwave discharges for CO<sub>2</sub> conversion*, Poster P177
14. 25th ESCAMPIG (Europhysics Conference on Atomic and Molecular Physics of Ionized Gases) 2022, 2022/07/19-2022/07/23, Paris, France, M. Altin, P. Viegas, L. Vialetto, A.W. van de Steeg, S. Longo, G.J. van Rooij, P. Diomedea, *Integrating the Fokker-Planck approach to vibrational kinetics in a self-consistent N<sub>2</sub> plasma global model*, Poster P183
15. 25th ESCAMPIG (Europhysics Conference on Atomic and Molecular Physics of Ionized Gases) 2022, 2022/07/19-2022/07/23, Paris, France, F.M.A. Smits, W.A. Bongers, F.J.J. Peeters, C.F.A.M. van Deursen, M.C.M. van de Sanden, *Inclusion of gas separation changes optimum plasma operation conditions*.



- Analysis of improvements. Efficiency and conversion optimisation of tubular vortex flow stabilised microwave plasma reactors*, Poster 296
16. 41st Benelux Meeting on Systems and Control, 2022/07/05-2022/07/07, Brussels, Belgium, B.F.H. van den Boorn, A. Bieberle-Hütter, M. van Berkel, *Global sensitivity analysis of a microkinetic model of the oxygen evolution reaction*, Oral
  17. Catalysis Fundamentals and Practice Summer School, 2022/07/18-2022/07/22, Liverpool, UK, M.A. Bento, E. David, J. Rocha, M.A. Gleeson, P. Martinho, *CO<sub>2</sub> photoreduction and plasma catalysis using Fe(II) complexes*, Poster
  18. 2022 Gordon Research Conference Renewable Energy: Solar Fuels - Advancing Complexity, Selectivity and Efficiency in Artificial Photosynthesis, 2022/05/08-2022/05/13, Lucca, Italy, N.P. Prasad, S. Schneider, E. Hensen, J.P. Hofmann, A. Bieberle-Hütter, *Bismuth oxide overlayers for improving the performance of BiMn<sub>2</sub>O<sub>5</sub> photoanodes*, Poster
  19. 18th International Conference on Plasma Surface Engineering (PSE 2022), 2022/09/12-2022/09/15, Erfurt, Germany, S. Welzel, A.P.H. Goede, M.C.M. van de Sanden, M.N. Tsampas, *Power-to-X: on the development of a KEROGREEN reactor module for sustainable CO production and the challenges in CO<sub>2</sub> plasmolysis and gas separation*, Oral TW0104
  20. 73rd annual meeting of the International Society of Electrochemistry 2022, 2022/09/12-2022/09/16, Online, Switzerland, F.M. Sapountzi, M. Lavorenti, W.L. Vrijburg, S. Dimitriadou, T.V. Pfeiffer, M.N. Tsampas, *Spark ablation for the manufacturing of efficient and durable catalyst-coated membranes for PEM water electrolysis*, Oral s10
  21. E-MRS Fall Meeting 2022, 2022/09/19-2022/09/22, Warsaw, Poland, M.N. Tsampas, M. Lavorenti, W.L. Vrijburg, S. Dimitriadou, T.V. Pfeiffer, F.M. Sapountzi, *Catalyst-coated membranes for PEM water electrolysis fabricated with spark ablation*, Oral Q.09.01
  22. E-MRS Fall Meeting 2022, 2022/09/19-2022/09/22, Warsaw, Poland, M. Lavorenti, P. Kunturu, F. van Schijndel, H. Johnson, S. Kinge, M.N. Tsampas, *Turning ambient air humidity into hydrogen by sunlight*, Oral Q.11.02
  23. E-MRS Fall Meeting 2022, 2022/09/19-2022/09/22, Warsaw, Poland, M. Lavorenti, *Alternative hydrogen production via solar assisted methods*, Oral, 3-slides-pitch
  24. E-MRS Fall Meeting 2022, 2022/09/19-2022/09/22, Warsaw, Poland, P. Kunturu, M. Lavorenti, P. Varadhan, S. Bera, H. Johnson, S. Kinge, M.C.M. van de Sanden, M.N. Tsampas, *Bias-free solar hydrogen production in a zero gap PEC cell with abundant electrode materials and polymeric electrolyte membranes*, Oral Q.09.14
  25. CHAINS 2022 (CHemistry As INnovating Science), 2022/09/21-2022/09/22, Veldhoven, The Netherlands, F. Verdelli, *Vibrational strong coupling with periodic particle arrays*, Oral
  26. CHAINS 2022 (CHemistry As INnovating Science), 2022/09/21-2022/09/22, Veldhoven, The Netherlands, B.F.H. van den Boorn, M. van Berkel, A. Bieberle-Hütter, *Global sensitivity analysis: a methodological framework and case study of the oxygen evolution reaction*, Poster
  27. CHAINS 2022 (CHemistry As INnovating Science), 2022/09/21-2022/09/22, Veldhoven, The Netherlands, M.C. Sorkun, S. Er, *Exploration of chemical space with ChemPlot*, Oral
  28. 2nd International Conference on Unconventional Catalysis, Reactors and Applications (UCRA 2022), 2022/09/21-2022/09/23, Warwick, UK, M.C.M. van de Sanden, X. Chen, A. Pikalev, F.M.A. Smits, W.A. Bongers, S. Welzel, M.N. Tsampas, *Plasma-electrochemical conversion processes using an ion conducting membrane: Enhancement of oxygen permeation through SOEC with He/O<sub>2</sub> plasma*, Oral O4.13
  29. NWO-NERA Energy Symposium 2022 'Promoting Interdisciplinary Research towards a successful Energy Transition', 2022/11/11, Eindhoven, Netherlands, U. Mushtaq, *Development of electrode-supported proton conducting solid oxide cells for Power-to-X applications*, Oral
  30. NWO-NERA Energy Symposium 2022 'Promoting Interdisciplinary Research towards a successful Energy Transition', 2022/11/11, Eindhoven, Netherlands, M.C.M. van de Sanden, *E-fuels and E-chemicals*, Oral
  31. NWO-NERA Energy Symposium 2022 'Promoting interdisciplinary research towards a successful energy transition', 2022/11/11, Eindhoven, Netherlands, G.J. van Rooij, *A plasma chemistry approach to biogas valorization*, Oral
  32. AVS 68th International Symposium and Exhibition, 2022/11/06-2022/11/11, Pittsburgh, PA, USA, C.F.A.M. van Deursen, H. van Poyer, Q. Shen, W.A. Bongers, F.J.J. Peeters, F.M.A. Smits, M.C.M. van de Sanden, *Optimization of CO<sub>2</sub> dissociation efficiency and conversion in vortex-stabilized microwave plasmas by effluent nozzles*, Oral PS+AS-MoA-11
  33. AVS 68th International Symposium and Exhibition, 2022/11/06-2022/11/11, Pittsburgh, PA, USA, E. Devid, M.C.M. van de Sanden, M.A. Gleeson, *Gasification of carbon and CO<sub>2</sub> Into CO at low vacuum through combined plasma and heating exposure*, Oral PS+AS-MoA-6

34. KEROGREEN Final Event 27 September 2022, 2022/09/27, Karlsruhe, Germany, A. Goede, *CO<sub>2</sub> neutral fuels*, Oral
35. KEROGREEN Final Event 27 September 2022, 2022/09/27, Karlsruhe, Germany, S. Welzel, P. Pfeifer, *Highlights from KEROGREEN's plasma-route towards e-Kerosene*, Oral
36. KEROGREEN Final Event 27 September 2022, 2022/09/27, Karlsruhe, Germany, H. Johnson, G. Zafeiropoulos, P. Varadhan, P. Kunturu, M. Lavorenti, M.N. Tsampas, *Porous photoelectrodes for scalable solar fuel production*, Oral
37. Aarhus Power-to-X Symposium 2022, Uniting Industry and Academia on New Solutions for Carbon-Neutrality, 2022/06/01-2022/06/03, Aarhus, Denmark, A. Goede, *DIFFER development in solar fuels*, Oral
38. SUPEERA Workshop on Energy Storage 2022, 2022/05/10-2022/05/12, Padova, Italy, A. Goede, *Electrochemical conversion of water and air (CO<sub>2</sub>, N<sub>2</sub>) into high energy density chemicals powered by renewable electricity*, Oral
39. CINEA CCUS Alternative Fuels Workshop 2022 (CINEA: European Climate, Infrastructure and Environment Executive Agency), 2022/09/22-2022/09/23, Brussels, Belgium, A. Goede, *The KEROGREEN CO<sub>2</sub> plasma route to CO and alternative fuels*, Oral

#### 2.10 Positions, including editorships: 36

1. M.C.M. van de Sanden, Editorial Board member of the journal *Global Transitions* (since 2018), 2022, Editorship
2. M.C.M. van de Sanden, Member of the Editorial Board of the Journal *Applied Sciences* (since 2016), 2022, Editorship
3. M.C.M. van de Sanden, International Advisory Board for the journal *Plasma Processes and Polymers* (since 2002), 2022, Editorship
4. M.C.M. van de Sanden, Senior Advisory Board Member of *Plasma Sources: Science and Technology* (since 2005, Senior since 2014), 2022, Editorship
5. A. Bieberle-Hütter, Member editorial board *Journal of Physics: Energy* (since 2022), 2022, Editorship
6. A. Bieberle-Hütter, Member editorial board of the Dutch physics.org website (since 2018), 2022, Editorship
7. A. Bieberle-Hütter, Member Organising committee 2022 COST Action 18234, Annual meeting, online, Geneva, Switzerland, 2022
8. S. Er, Guest Editor for MDPI *Batteries* Special Issue on 'Material Design and Development for Redox Flow Batteries II', 2022, Editorship
9. A. Bieberle-Hütter, Subprogram leader: Materials Science, European joined program AMPEA (since 2019), 2022
10. A. Bieberle-Hütter, Leader Work Group "Microscale and Continuum Modeling" of COST Action Computational materials sciences for efficient water splitting with nanocrystals from abundant elements (2019-2023) and member organizing committee Annual meeting 2022 February, 2022
11. A. Bieberle-Hütter, Member Advisory board Raad voor de Scheikunde (Dutch Chemistry Council) (since 2020), 2022
12. A.P.H. Goede, Coordinator European EERA Joint Programme Energy Storage, Subprogram 2 Chemical Energy Storage (since 2017), 2022
13. A.P.H. Goede, Coordinator European EU Horizon2020 project KEROGREEN (2017-2022), 2022
14. A.P.H. Goede, Fellow of European Physical Society (since 2011), 2022
15. A.P.H. Goede, Member of the Technical Advisory Board of the German BMBF KOPERNIKUS 10 year Programme P2X (since 2016), 2022
16. S. Welzel, Lecturer Course series Optical Diagnostics, techniques and applications at Eindhoven University of Technology: *Infrared Absorption Spectroscopy: Theory, techniques & applications* (2014-2022), 2022
17. S. Er, Contributor to NWO Roadmap Thematic Digital Competence Center for Natural and Engineering Sciences, 2022
18. S. Er, Monitor Panel Member at H2020 BATTERY2030+ BIG-MAP Project, 2022
19. S. Er, Member European Energy Research Alliance Joint Program on Energy Storage, 2022
20. S. Er, Member NWO Physics Research Community Nano, Quantum and Materials, 2022
21. S. Er, Member NWO Chemistry Research Community Fundamentals and Methods, 2022
22. S. Er, Member Writing committee NWO Roadmap National Strategic Agenda for Computational Sciences (NACS), 2022
23. S. Er, Member Scientific Integrity Liaison Team, between DIFFER and NWO, 2022

24. M.C.M. van de Sanden, Member of the EASAC Energy Steering Panel (European Academies) (since 2014), 2022
25. M.C.M. van de Sanden, Chair Advisory Committee ECCM (ElektroChemische Conversie en Materialen) of Dutch Top Research Sections Energy, Chemistry and HTSM (since 2017), 2022
26. M.C.M. van de Sanden, Member Board NWO Domain Applied and Engineering Sciences (AES, in Dutch: TTW) (since 2021), 2022
27. M.C.M. van de Sanden, Board member and NWO liaison (waarnemer) TKI nieuw Gas, Groningen (since 2014), 2022
28. M.C.M. van de Sanden, Member Scientific Board Netherlands Energy Research Alliance (NERA) (since 2017), 2022
29. M.C.M. van de Sanden, Parttime professorship in the Department EIRES (since 2011 after fulltime since 2000), 2022
30. M.C.M. van de Sanden, Fellow of the International Plasma Chemistry Society (since 2017), 2022
31. M.C.M. van de Sanden, Member of the Royal Netherlands Academy of Arts and Sciences (KNAW) (since 2013), 2022
32. M.C.M. van de Sanden, Member KNAW Klimaat Klankbordgroep (since 2021), 2022
33. M.C.M. van de Sanden, Member Scientific Advisory Board of the CNR Institute of Nanotechnology, Salento (since 2018), 2022
34. M.C.M. van de Sanden, Member International Scientific Advisory Committee and Chair International Summer School on Vacuum, Electron and Ion Technologies VEIT (since 2015), 2022
35. M.C.M. van de Sanden, Member Organising committee and chair of ECCM Conference 2022, June 24th, Eindhoven, Netherlands, 2022
36. M.C.M. van de Sanden, Organizer AVS Conference - Program: Plasma Science and Technology division (since 2012), 2022

#### 2.11 Public events and industry contacts: 4

1. Stuurgroep Landbouw Innovatie Brabant 'Glastuinbouw - Energie en Samenwerking', 2022/03/23, Beek en Donk, Netherlands, M.C.M. van de Sanden, *De energietransitie in de bredere context*
2. Dutch Parliament committee / Tweede Kamer commissie, 2022/04/14, the Hague, Netherlands, M.C.M. van de Sanden, Technische briefing Second opinion op factsheet (for Dutch Parliament): *Toekomst verduurzaming luchtvaart (Future sustainable aviation)*
3. *Second opinion op factsheet en technische briefing (for Dutch Parliament): Toekomst verduurzaming luchtvaart (Future sustainable aviation)*, Dutch Ministry Infrastructure and Water management, 2022, H. Werij, M.C.M. van de Sanden, H. Hoeijmakers
4. DIFFER Colloquium 2022, 2022/04/21, Eindhoven, Netherlands, S. Er, E. Westerhof, A. Vrouwe, *Dilemma Game: Research Integrity in Dilemmas*. Panel discussion on Ethics in Science

#### 2.12 Awards: 7

1. T.A.A.M. Peeters, Best Graduation Achievement 2022 Fontys University of Applied Sciences Bachelor on water electrolysis at DIFFER, 2022/09/29
2. M.C. Sorkun, D. Mullaj, J.M. V. A. Koelman, S. Er, Cover Picture Chemistry. Methods for paper: Chem. Methods 2 (2022) e202200005, ChemPlot, a Python Library for Chemical Space Visualization, 2022/07
3. P. Diomede, ESCAMPIG 2020 William Crookes' prize, 2022/07/19
4. U. Mushtaq, 2022 Best Poster prize at Aarhus Power-to-X Symposium, 2022/06/03
5. H.Y. Ma, R.K. Sharma, S. Welzel, M.C.M. van de Sanden, M.N. Tsampas, W. Schneider, Nature Communications' Catalysis Editors' Highlights webpage ranking for: Nat. Commun. 13 (2022) 402, Observation and rationalization of nitrogen oxidation enabled only by coupled plasma and catalyst, 2022
6. P. Kunturu, Best Poster Presentation Award 2022 E-MRS Fall meeting, 2022/09/22
7. V. Guerra, T. Silvae, N. Pinhao, M.C.M. van de Sanden, M.N. Tsampas, Journal of Applied Physics Editor's picks webpage ranking for: J. Appl. Phys. 13 (2022) 402, Plasmas for in-situ resource utilization on Mars: fuels, life-support and agriculture, 2022

#### 2.13 Media appearances: 29

1. Digitalisering en energie: méér dan de som der delen, LinkedIn Post by Arash Aazami, 2022/02/18, Interview with M.C.M. van de Sanden

2. Hoe kooldioxide om te zetten in bouwstenen voor brandstof, Link Magazine, 2022/03/01, Interview with A. van de Steeg
3. Meer inzicht in de omzetting van kooldioxide naar brandstof, De Ingenieur, 2022/03/04, Interview with A. van de Steeg
4. Solar Fuels: Harnessing energy from the sun, Academic Positions, Stockholm, Sweden, 2022/05/06, Interview with A. Bieberle-Hütter
5. Cover Profile Interview July issue Chemistry Methods: ChemPlot, a Python Library for Chemical Space Visualization, Wiley / ECSP, 2022/07/01, Interview with S. Er
6. Succes van Brainport Eindhoven is uniek en niet eenvoudig te repliceren, ESB, 2022/07/06, General coverage
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