

CV – Stanislas PAMELA

BASIC DETAILS

Name : Dr. Stanislas PAMELA
Current position : Head of AI & Machine Learning Group at UKAEA
Employer : CCFE – UKAEA
Department : Computing Division
Address : D3-1-47, Culham Campus
 Abingdon OX14 3DB (UK)
Tel : +44 7583 277 097
Email : stanislas.pamela@ukaea.uk
Website : https://stanstash.com/spamela_profile

PERSONAL DETAILS

Date and place of birth : 05/Jan/1986, France
Nationality : French
Gender : He/Him/His
Languages : French (fluent), English (fluent), German (advanced)

PROFESSIONAL CAREER PATH

INTERIM-HEAD OF COMP. SCIENCE & ENGINEERING UNIT (1/APR/2023 – NOW) :

Area: Digital Eng., HPC, Num. methods, Materials, AI/ML (~60 staff)
Employers: UKAEA-CCFE, Culham Campus, Abingdon, UK.

HEAD OF AI & MACHINE-LEARNING GROUP (1/APR/2022 – NOW) :

Area: AI & Machine-Learning for Fusion (10 members + PhDs)
Employers: UKAEA-CCFE, Culham Campus, Abingdon, UK.

HPC SPECIALIST RESEARCH SOFTWARE ENGINEER (15/APR/2019 – 1/APR/2022) :

Area: High-Performance-Computing & Cloud-Computing for Fusion
Employers: UKAEA-CCFE, Culham Campus, Abingdon, UK.

RESEARCH PHYSICIST (01/OCT/2013 – 14/APR/2019) :

Area: Numerical Simulation & Theoretical Analysis of
 Edge Stability in Tokamak Fusion Plasmas
Employers: UKAEA-CCFE, Culham Campus, Abingdon, UK.

POST-DOCTORAL POSITION (15/JUL/2010 – 30/SEPT/2013) :

Position Title: JET Operating Contract (JOC)
 Chain1, Chain2 & FLUSH Responsible Officer
Employers: EFDA-JET – CEA – Aix-Marseille Université
Assignment location: JET, Culham Campus, Abingdon, UK.

PHD POSITION (01/OCT/2007 – 14/JUL/2010) :

Thesis Title: Magnetohydrodynamic Simulation
 of Edge-Localised-Modes in a Tokamak
Employer: Institut de Recherche sur la Fusion Magnétique (IRFM)
 CEA Cadarache (FRANCE)
Financing: Agence Nationale de la Recherche (ANR),
 Project ASTER, ANR-CIS.2006.001
PhD Supervisor: G.T.A Huysmans (IRFM, CEA Cadarache)
PhD Univ. Supervisor: S. Benkadda (PIIM, Aix-Marseille Université)

EDUCATION**MASTER OF SCIENCE M.SCI. (2003-2007) :**

University: Imperial College London - UK
Course Title: Mathematics with a year in Europe
Grade: First Class
Specialization: Mathematical Physics (Phys. Fluids, Waves, Relativity, PDEs)
 Algebra (Geometry, Groups & Rings, Algebraic geometry)
Master Thesis: “Simulation of Thin-layer Fluid Flows on Arbitrary Surfaces”

ERASMUS YEAR IN GERMANY (2005-2006) :

University: Humboldt Universität zu Berlin - Germany
Specialization: Mathematics (Algebra, Algebraic geometry)
Grade: First Class

EUROPEAN BACCALAUREATE (2003) :

Institute: European School Culham – Oxfordshire, UK
Courses: Advanced mathematics, Physics, Chemistry, German, Music
Grade: 85%

MUSIC (2002) :

Violin: Grade-8 (UK top qualification before advanced studies)

NOTABLE ACHIEVEMENT**COMPETITIVE INTERNATIONAL PROJECTS AND CONFERENCES :****co-PI of UK-BEIS funded project FARSCAPE (2020-now)**

Title of project : “Fusion Applications Research into Scalable Computing Algorithms for Performance at the Exascale”
Total Budget : £11M in 2022-25
Team size : 60+ researchers
Institutes involved : CCFE-UKAEA (UK), Hartree Centre (STFC), Digilab Ltd, STFC-SCD-SciML, Oxford Univ., Bristol Univ., Manchester Univ.

PI of EUROfusion ENR Project AWP17-ENR-MFE_CCFE-01 (2017-2018)

Title of project : “Understanding the role of reconnection in filament separation and its impact on plasma exhaust in tokamaks”
Total Budget : €534,000, 12.5 person-per-year
Team size : 20 researchers
Institutes involved : CCFE (UK), Manchester University (UK), Warwick University (UK), Aristotle University (Greece), CNR (Italy), CEA (France), Eidhoven University (Netherlands)

PI of PRACE Grant for Tier-0 Supercomputing Resources (2017-2018)

Title of project : “JOREK_MHD: Validation of simulations of MHD instabilities in tokamak plasmas for extrapolation to ITER.”
CPU budget : 30 Million core.hours over 12 months
Team size : 10 researchers
Institutes involved : CCFE (UK), CEA (France), Nice University (France), ITER (IO), IPP Garching (Germany)

Co-Scientific Coordinator of WPJET1 Task T15-02 (2015-2016)

Title: “Pedestal Analysis & Modelling”
Experimental device: Joint European Torus (JET)
Main Scientific Leader: Dr. Costanza Maggi (CCFE-UKAEA)
Team size : 49 Researchers
Institutes involved : EUROfusion associations

Notable Fusion Conference Contributions:

Oral at 42nd European Physics Society EPS-2015 (Lisbon, Portugal)
 Oral at 27th IAEA Fusion Energy Conference 2016 (Kyoto, Japan)
 Overview at 28th IAEA Fusion Energy Conference 2018 (Ahmedabad, India)

Notable Recent 1st-authored Journal Contributions:

- Filamentary plasma eruptions and their control on the route to fusion energy
C.Ham, A.Kirk, S.Pamela, H.Wilson
Nature Reviews Physics volume 2, pages159–167 (2020)
<https://doi.org/10.1038/s42254-019-0144-1>
 - A Generalised Formulation of G-continuous Bezier Elements Applied to Non-linear MHD
S.Pamela, G.Huijsmans, M.Hoelzl
Journal of Computational Physics 111101 (2022)
<https://doi.org/10.1016/j.jcp.2022.111101>
 - Neural-Parareal: Dynamically Training Neural PDE Solvers as Coarse Approximators for Time-Parallelisation of Fusion MHD Simulations
S.Pamela and co-authors
Aiming for Journal of Computational Physics (2024)
in preparation
- For full list of publications, see [S J P Pamela's Google Scholar](#)

FIELDS OF EXPERTISE

MACHINE-LEARNING, AI & ADVANCED VISUALISATION :

Supervision of AI/ML researchers & PhDs :

- UKAEA Staff: V.Gopakumar, L.Zanisi, N.Carey, S.Jackson, N.Amorisco, N.Bhatia, S.Etches, C.Siddle, D.Brennand
- PhDs: E.Ozturk, E.Crovini, E.Lewis, M.Marshall
- Graduate placement: O.El-Zobaidi

Technical projects :

- HPC-parallelisation of ML workflows in Tensorflow
- Fast-camera image analysis and classification
- ML-workflows on novel HPC architectures
- Converging AI and HPC algorithms (Neural-PDE solvers and time-parallelisation)

HPC AND NUMERICAL DEVELOPMENT :

- Yearly CPU consumption on supercomputing clusters : >20 Million core.hours
- Cloud Computing : Kubernetes, Spark, Docker, Harbor
- Programming : bash, Fortran, C, Python, Latex, Perl, HTML, CSS, PHP, JavaScript, XML, json, HDF5, git, svn, cvs, Matlab, IDL, MDSplus, MPI, openMP
- VVUQ: Dakota, VECMA
- Non-linear 3D simulation
- Open-MPI parallel computing
- Competent user of large matrix solvers (MUMPS, PastiX, Strumpack, PETSc)
- FEM and mesh-generators
- Data visualization (vtk, Kitware-Paraview, Nvidia-Omniverse)
- Synthetic diagnostics for simulations (eg. visible/InfraRed camera, realistic rendering)
- Interfacing between programming languages
- Web dev: built personal “dropbox” (<https://stanstash.com>) before O365 or G-Drive existed

PLASMA PHYSICS IN FUSION DEVICES :

- 3D non-linear magnetohydrodynamic simulation of fusion plasmas
- Pedestal and ELM physics in tokamaks
- Tokamak plasma filamentation
- Transverse and parallel transport in tokamak Scrape-Off Layer
- Quantitative and qualitative validation of simulations against experimental data

MAINTENANCE OF NUMERICAL TOOLS AND DATA-ANALYSIS (2010-2013) :

- Chain1/Chain2 : Data-analysis suite on the JET tokamak (~110 diagnostic codes)
- Flush / ITM-Flush : Public library to exploit tokamak magnetic equilibria
- Surf : Visualisation software for magnetic equilibria and diagnostics on JET

OTHER ROLES AND RESPONSIBILITIES

STUDENTS MANAGEMENT :

Recruitment coordinator for MSc & Undergraduate student placements (2016-2019)

Universities: UK and EU universities

Programs: Summer placements (3 months), Year-in-Industry Scheme (12 months)

Typical number of placements : ~7 Year-in-Industry placements, ~12 Summer placements

Culham PhD Showcase coordinator (2016-2018)

Event : 2-day event for all PhD students affiliated with CCFE across all UK Universities

Universities : UK universities

Typical attendance : 40 PhD students (plus visitors attending open sessions)

STUDENT SUPERVISION AND TUITION :

M.Marshall: PhD at University of York (2021-now) with Prof. H.Wilson

E.Lewis: PhD at University College London (2020-now) with Prof. Y.Andreopoulos

E.Ozturk: PhD at Imperial College London (2020-now) with Prof. A.Ghosh

E.Crovini: PhD at Imperial College London (2020-now) with Prof. A.Duncan

S.F.Smith: PhD at CCFE (2016-2019) with Prof. H.Wilson

SK.Kim: PhD at Seoul National University, S.Korea (2016-2020)

M.Duff: MSc student (3 months placement in 2014)

A-level student (2 weeks placement in 2014)

REFERENCES AT UKAEA

DR R. AKERS:	POSITION :	DIRECTOR OF COMPUTING PROGRAMMES
	Email :	rob.akers@ukaea.uk
DR A. HYNES:	POSITION :	DIRECTOR OF COMPUTING OPERATIONS
	Email :	andrew.hynes@ukaea.uk
DR C. HAM:	POSITION :	HEAD OF MHD GROUP IN PLASMA DIVISION
	Email :	christopher.ham@ukaea.uk
DR D. McDONALD:	POSITION :	PLASMA DIVISION MANAGER
	Email :	darren.mcdonald@ukaea.uk

REFERENCES OUTSIDE UKAEA

PROF G. HUIJSMANS:	POSITION :	SENIOR SCIENTIFIC OFFICER AT CEA
		Prof. at Technische Universiteit Eindhoven, Netherlands
	Address :	IRFM, CEA Cadarache
		F-13108 Saint-Paul-lez-Durance, France
	Email :	guido.huijsmans@cea.fr
PROF V. ALEXANDROV:	POSITION :	CHIEF SCIENCE OFFICER, HARTREE CENTRE, STFC
	Address :	Hartree Centre, Daresbury, Warrington WA4 4AD, UK
	Email :	vassil.alexandrov@stfc.ac.uk
PROF Y. ANDREOPOULOS:	POSITION :	DIRECTOR AT SONY INTERACTIVE ENTERTAINMENT
		FORMERLY PROF. IN MACHINE LEARNING AT UCL, UK
	Address :	London, UK
	Email :	Yiannis.Andreopoulos@sony.com

HOBBIES

Family, Windsurfing, Guitar, Piano, Violin, Windsurfing, Windsurfing, and also Windsurfing