First name: **Madalina**
Surname: **VLAD**
Institute: Institute of Atomic Physics,
National Institute of Laser, Plasma and Radiation Physics,
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- **EDUCATION**

PhD: Institute of Atomic Physics, Bucharest, 1992
Title - "Theoretical and numerical studies of transport processes in plasmas"
Supervision - Prof. Ioan-Iovit Popescu, Member of the Romanian Academy
MSc: Faculty of Physics, University of Bucharest (1972-1977);
Degree in nuclear physics with a grade point average over 5 years of 98%.

- **CURRENT POSITION(S)**

1978 – present: National Institute of Laser, Plasma and Radiation Physics, Magurele, Plasma Theory Group, Bucharest Romania [1990 - Senior Researcher III; 1993 - Senior Researcher II; 1999 - Senior Researcher I]

- **PREVIOUS POSITIONS**

1992 – 2008 I have worked for periods of 2-8 months/year, for a total of *nine years*, in research centres in France, Japan, Belgium:

- Commissariat à l'Energie Atomique, Département de Recherche sur la Fusion Controlée, Saint-Paul-lez-Durance, France (1994-2003, for periods of 2-7 months/year that add to 5 years);
- Université Libre de Bruxelles, Belgium (October-December 1993, September-October 1994, Mars-April 1997);
- FOM Institute of Plasma Physics, Nieuwegein, The Netherlands (Mars-May 1993);
- Invited professor at the National Institute for Fusion Science, Toki, Japan (January-June 2003);
- Invited professor at Kyushu University, Japan (October 2004 - March 2005);
- ENEA-Frascati, Italy (May-June 2004, November 2005);
- JET-Culham Science Centre, Abingdon, UK (May-June 2006, February 2007);
- Université de Provence, Marseille, France (May-June 2005, March 2006, May-June 2007);
- Director of Research CNRS, temporary position for foreigner scientists at Université de Provence, Marseille, France (October 2007-March 2008).

- **INSTITUTIONAL RESPONSIBILITIES**

2011-2014 Head of the Research Unit of the Association EURATOM – MEdC (Ministry of Education and Research) Romania.
2008-2014 Chairman of the Scientific Council of National Institute of Laser, Plasma and Radiation Physics
2011-2013 delegate in charge of representation of Romania in the Steering Committee of the European Fusion Development Agreement
2014 delegate in charge of representation of Romania in the General Assambly of the Consortium EUROfusion

- 2014 –present: Professor at the Doctoral School of the Faculty of Physics, University of Bucharest

- **COMPETITIONALY OBTAINED PROJECTS AND GRANTS**

1998-2002	Co-director of the NATO Linkage Grants CRG.LG 971484 and PTS CLG 977 397, based on the collaboration between groups from DRFC-Cadarache (France), Universite Libre de Bruxelles (Belgium) and our institute.
2006-2008	Director of the National Project "Turbulence and quasi-coherent structures in fluids and space plasmas".
2008-2011	Director of the National Project „Nonlinear evolution, qusi-coherence and transport in turbulent fluids".
2009-2014	Director of the Euratom Project "Understanding the ExB drift nonlinear effects on transport and structure generation in turbulent tokamak plasmas".
2014	Responsible of the collaboration to the EUROfusion Project „WPENR_P: Turbulence Control and Self-Organization (ER_CEA-10)"
2014-2016	Director of the EUROfusion Complementary Project „WPENR_C: Confinement degradation and improvement in turbulent plasmas"
2017-2018	Director of the EUROfusion Project „WPENR_P: New semi-analytical method for the study of turbulence in ITER plasmas"

- **PUBLICATION SUMMARY**

- Articles in refereed international ISI journals: **93**
- Papers presented at international conference and in conference proceedings: **122**
- Electronic preprint arXiv.org: **35**
- Impact factor divided by the numbers of authors: **78**

- **EXPERIENCE**

- Theoretical and experimental research in transient plasmas (1978-1986);
- Studies of inverse problems (1980-1985) (two dimensional tomography, numerical methods and codes for solving ill-posed problems in the sense of Hadamard)
- Numerical simulations of tokamak plasma evolution (1983-1989)
- Fluid dynamics numerical simulations (1988-1990) (thin molten layers)
- Fluid representation of quantum mechanics (1990-1992) (methods of fluid dynamics applied to the quantum potential representation of quantum mechanics)
- Functional-integral approach to plasma turbulence (1988-1996)
- Statistical physics of turbulence, stochastic processes (since 1988) (methods for determining the distribution and the transport coefficients for the stochastic advection of particles and fields, effects of trapping, local and statistical conservation constraints, etc)
- Theoretical studies of plasma turbulence (since 1988) (method for the theoretical study of plasma turbulence based on the functional integration on the space of particle trajectories, studies of drift turbulence, studies of the transport in electrostatic and magnetic turbulence, etc.)

- **The present research domain is plasma turbulence, structure generation and statistical physics of anomalous transport in plasmas**

- **MAJOR COLLABORATIONS**

- Institute of Plasma Physics, Prague (1979-1990)
- Institute of Atomic Energy "I.V.Kurchatov", Moscow (1986-1990)

- Commissariat a l'Energie Atomique - Cadarache, France (1992-prezent)
- Université Libre de Bruxelles, Belgium (1992-2006)
- ENEA-Frascati, Italy (2004-2007)
- Université de Provence, Marseille, France (2005-prezent)

- **PUBLICATIONS IN ISI JOURNALS DURING THE LAST 5 YEARS**

1. M. Vlad, „*Ion stochastic trapping and drift turbulence evolution*", **Physical Review E 87** 053105 (2013).
2. M. Vlad, F. Spineanu, *„Test particle study of ion transport in drift type turbulence",* **Physics of Plasmas 20** 122304 (2013).
3. J.-I. Yano, M. Vlad, S. H. Derbyshire, J.-F. Geleyn, K. Kober, „*Generalization, consistency, and unification in the parameterization problem"*, **Bulletin of the American Meteorological Society 95**, Issue 4 (2014) 619-622.
4. M. Vlad, F. Spineanu, *„Diffusion and stochastic island generation in the magnetic field line random walk",* **Astrophysical Journal 791** (2014) 56.
5. F. Spineanu, M. Vlad, *Statistical analysis of the linking number in stochastic magnetic fields*, **Romanian Reports in Physics, Vol. 67** (2015) 573–585
6. M. Vlad, F. Spineanu, *„Evolution of plasma turbulence beyond the quasilinear stage; a semi-analytical study",* **Romanian Reports in Physics, Vol. 67** (2015) 1074–1086.
7. B. Weyssow, M. Negrea, G. Steinbrecher, I. Petrisor, D. Constantinescu, N. Pometescu, M. Vlad, F. Spineanu, *Ideas in fusion plasma physics and turbulence,* **Romanian Reports in Physics, Vol. 67** (2015) 547–563.
8. F. Spineanu, M. Vlad, *Self-organization of the vorticity field in two-dimensional quasi-ideal fluids: The statistical and field-theoretical formulations*, **Chaos, Solitons and Fractals 81** (2015) 473-479.
9. M. Vlad, F. Spineanu, *Trajectory statistics and turbulence evolution*, **Chaos, Solitons and Fractals 81** (2015) 463-472.
10. M. Vlad, F. Spineanu, *Electron heat transport multi-scale turbulence*, **Physics of Plasmas 22** (2015) 112305.
11. M. Vlad, F. Spineanu, A. M. Croitoru *Nonlinear effects in particle transport in stochastic magnetic fields,* **Astrophysical Jornal** 815 (2015) 11.
12. F. Spineanu, M. Vlad, *A MHD invariant with effects on the confinement regimes in Tokamak,* **Nuclear Fusion 56** (2016) 092005.
13. M. Vlad, F. Spineanu, *Direct effects of the resonant magnetic perturbation on turbulent transport,* **Nuclear Fusion 56** (2016) 092003.
14. Croitoru A. M., Palade D. I., Vlad M., Spineanu F., *Turbulent transport of alpha particles in tokamak plasmas,* **Nuclear Fusion 56** (2017) 036019 (8p).
15. F. Spineanu, M. Vlad, *On the late phase of relaxation of two-dimensional fluids: turbulence of unitons,* Focus on Turbulence in Astrophysical and Laboratory Plasmas, **New Journal of Physics 19** (2017) 025004 (12p).
16. Vlad M, Spineanu F, *Randon and quasi-coherent aspects in particle motion and their effects on transport and turbulence evolution*, Focus on Turbulence in Astrophysical and Laboratory Plasmas, **New Journal of Physics 19** (2017) 025014 (20p).
17. M. Vlad, F. Spineanu, *Combined effects of hidden and polarization drifts on impurity transport in tokamak plasmas*, **Phys. Plasmas 25**, 092304 (2018).
18. M. Vlad, *Effects of the mean field gradients on magnetic field line random walk,* **Astrophysical Journal 867**:104 (2018).
19. M. Vlad, F. Spineanu, *Hidden drifts in turbulence*, **Europhysics Letters (EPL) 124**, 60002 (2018).