

NEKTARIOS VLAHAKIS

Work Address

Section of Astrophysics, Astronomy & Mechanics
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Education

UNIVERSITY OF CRETE

Heraklion, Greece

1994-1998

Ph.D. in Astrophysics. Dissertation title:
“*Analytical modeling of Cosmic Winds and Jets*”
Supervisor: Professor Kanaris Tsinganos

1992-1994

Master of Science in Physics.

ARISTOTLE UNIVERSITY OF THESSALONIKI

Thessaloniki, Greece

1988-1992

Diploma (Grade: *Excellent*) in Physics.

Research Interests

Plasma Astrophysics – Relativistic/non-Relativistic Magnetohydrodynamics – Nonlinear Differential Equations – Solar and Stellar Winds – Accretion Disks – Cosmic Jets – Plasma Equilibrium and Stability – AGN (quasars, blazars) – Gamma-Ray Bursts – Pulsar Winds

Employment

SECTION OF ASTROPHYSICS, ASTRONOMY & MECHANICS, DEPARTMENT OF PHYSICS,
UNIVERSITY OF ATHENS

Athens, Greece

2003-present

Lecturer.

DEPARTMENT OF ASTRONOMY & ASTROPHYSICS AND ENRICO FERMI INSTITUTE,
UNIVERSITY OF CHICAGO

Chicago, IL, USA

2000-2003

Research Associate – Theoretical Astrophysics.

Military Service

Greece

1999-2000

UNIVERSITY OF CRETE

Heraklion, Greece

1992-1998

Teaching Assistant.

FOUNDATION OF RESEARCH AND TECHNOLOGY

Heraklion, Greece

1992-1998

IESL Research Fellow.

ARISTOTLE UNIVERSITY OF THESSALONIKI

Thessaloniki, Greece

1992

Teaching Assistant.

- Honors** 2000-2002 Chicago, USA
McCormick Fellowship at the Enrico Fermi Institute, University of Chicago.
- 1992 Thessaloniki, Greece
Highest diploma grade at the Aristotle University.
- 1992 Heraklion, Greece
3rd Prize, Summer School on Physics at the University of Crete with the participation of students from all Physics departments of Greece.
- 1988-1992 Thessaloniki, Greece
Fellowship in the Physics Department at the Aristotle University (11th out of 220).
- Teaching Assistant** UNIVERSITY OF CRETE Heraklion, Greece
1992-1998
Electromagnetism I, Electromagnetism II, Astrophysics II, Physics I, Physics II, Laboratories courses for mechanics.
- UNIVERSITY OF THESSALONIKI Thessaloniki, Greece
1992
Astrophysics I.
- Personal** Born: February 04, 1971 (Agios Nikolaos, Greece).
Citizenship: Greek.
Marital status: Married.
Hobbies: Chess, Photography.
Languages: Greek (native), English.

PUBLICATIONS

Ph. D. Thesis

1. *Analytical modeling of Cosmic Winds and Jets*, Nektarios Vlahakis, Ph.D. thesis, University of Crete, Heraklion 1998

Refereed

2. *On the topological stability of astrophysical jets*, Vlahakis, N. & Tsinganos, K. 1997, MNRAS, 292, 591
3. *Systematic Construction of Exact MHD models for Astrophysical Winds and Jets*, Vlahakis, N. & Tsinganos, K. 1998, MNRAS, 298, 777
4. *A class of exact MHD models for astrophysical jets*, Vlahakis, N. & Tsinganos, K. 1999, MNRAS, 307, 279
5. *Steady MHD Solutions for Collimated Winds*, Trussoni, E., Sauty, C., Tsinganos, K., & Vlahakis, N. 1999, Ap&SS, 264, 183
6. *A disk-wind model with correct crossing of all MHD critical surfaces*, Vlahakis, N., Tsinganos, K., Sauty, C., & Trussoni, E. 2000, MNRAS, 318, 417
7. *Magnetohydrodynamics of Gamma-Ray Burst Outflows*, Vlahakis, N. & Königl, A. 2001, ApJL, 563, L129
8. *Systematic construction of exact 2-D MHD equilibria with steady, compressible flow in Cartesian geometry and uniform gravity*, Petrie, G. J. D., Vlahakis, N., & Tsinganos, K. 2002, A&A, 382, 1081

9. *Hydromagnetic Acceleration in Relativistic Outflows*,
Vlahakis, N. 2003, *New Astronomy Reviews*, (in press)
10. *Relativistic Magnetohydrodynamics with Application to Gamma-Ray Burst Outflows: I. Theory and Semianalytic Trans-Alfvénic Solutions*,
Vlahakis, N. & Königl, A. 2003, *ApJ*, accepted, preprint astro-ph/0303482
11. *Relativistic Magnetohydrodynamics with Application to Gamma-Ray Burst Outflows: II. Semianalytic Super-Alfvénic Solutions*,
Vlahakis, N. & Königl, A. 2003, *ApJ*, accepted, preprint astro-ph/0303483
12. *Ideal MHD Solution to the σ problem in Crab-like Pulsar Winds and General Asymptotic Analysis of Magnetized Outflows*,
Vlahakis, N. 2003, *ApJ*, submitted.
13. *Neutron-Rich Hydromagnetic Outflows in Gamma-Ray Burst Sources*,
Vlahakis, N., Peng, F., & Königl, K. 2003, *ApJL*, submitted, preprint astro-ph/0306029

***Invited Chapters
in Special Volumes***

14. *On the Oscillatory Collimation of Astrophysical Jets*,
Tsinganos, K. & Vlahakis, N. 1998, in *Astrophysical Jets: Open Problems*, S. Masaglia and G. Bodo (eds.), Gordon and Breach Science Publishers, pp 43 - 51.
15. *MHD Modelling of Astrophysical Jets*,
Tsinganos, K., Trussoni, E., Sauty, C., & Vlahakis, N. 2001, in *AGN in their Cosmic Environment*, B. Rocca-Volmerange and H. Sol (eds.), EAS Publication Series Vol. 1, pp 63 - 74.

***Conference
Proceedings***

16. *MHD disk-Wind Solutions Crossing all Singularities*,
Trussoni, E., Vlahakis, N., Tsinganos, K., & Sauty, C. 2001 in *Particles and Fields in Radio Galaxies*, R.A. Laing and K.M. Blundell (eds.), ASP Conference Series, (in press).
17. *Systematic Construction of Exact Magnetohydrodynamic Models for Solar Coronal Structures and an Application to Modelling a Coronal Loop*,
Petrie, G. J. D., Vlahakis, N., & Tsinganos, K. 2001, in *5th Hellenic Astronomical Conference*, (in press).
18. *The Dynamics of Magnetized Outflows in GRBs*,
Vlahakis, N. & Königl, A. 2001, in *Gamma-Ray Burst and Afterglow Astronomy*, Proc. Woods Hole GRB meeting, Woods Hole Massachusetts, ed. Roland Vanderspek, (in press).
19. *Analytical Modeling of Hydromagnetic Jets in AGNs*,
Vlahakis, N. & Königl, A. 2002, in *Active Galactic Nuclei: from Central Engine to Host Galaxy*, ASP Conference Series, eds. S. Collin, F. Combes, and I. Shlosman, (in press).
20. *A model for GRB jets*,
Vlahakis, N. & Königl, A. 2003, in *Jets 2002: Theory and Observations in YSO's*, Proc. JENAM, eds. A.J.L. Fernandes, P.J.V. Garcia, J.J.G. Lima, (in press).
21. *Collimation of Astrophysical MHD Outflows*,
Tsinganos, K., Vlahakis, N., Bogovalov, S., Sauty, C., & Trussoni, E. 2003, in *Jets 2002: Theory and Observations in YSO's*, Proc. JENAM, eds. A.J.L. Fernandes, P.J.V. Garcia, J.J.G. Lima, (in press).
22. *Hydromagnetic Acceleration of GRB Outflows*,
Vlahakis, N. & Königl, A. 2003, in *Gamma Ray Bursts in the Afterglow Era – Third Workshop*, (in press).