

IOANNINA EXTENDED NODE

Scientist in Charge: Kyriakos Tamvakis

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Staff Members of the Extended Node

University of Ioannina (K. Tamvakis, C. Vayonakis, J. Vergados, G. Leontaris, J. Rizos, L. Perivolaropoulos, P. Kanti, A. Dedes)
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National Technical University of Athens (E. Papantonopoulos, A. Kehagias)
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University of Athens (A. Lahanas, N. Tetradis)
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Aristotle University of Thessaloniki (G. Lazarides, C. Panagiotakopoulos, N. Vlachos)
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National Research Center Demokritos (M. Axenides)
.....

University of Patras (S. Lola)

Research with Other Nodes

Research in collaboration with other nodes concentrated on the following main topics:

- 1) **Quantitative study of the Hawking Radiation emitted by Higher Dimensional Black Holes.** This research was carried out by members of the Ioannina team (**Tamvakis**) in collaboration with members of Durham Univ. (**Kanti**).
- 2) **Study of Supercritical String Theories and their implications to dark-matter constraints.** This research was carried out by members of the Univ. of Athens (**Lahanas**) in collaboration with members of King's College (**Mavromatos**).
- 3) **Cosmological implications of the violation of discrete symmetries (CP, L, R-parity, etc).** This research was carried out by the Univ. of Patras group (**Lola**) in collaboration with CERN (**Ellis**) and Univ. of Warsaw (**Lalak**).

Research Carried Out Locally

Research carried out locally or with scientists outside the network concentrated on :

1) *Systematic study of CMB data and the resulting constraints they impose on gravity. This research was carried out by Univ. of Ioannina members ([Perivolaropoulos](#)).*

2) *Higher codimension Branes. This research was carried out by members of the Athens National Technical Univ. group ([Papantonopoulos, Kehagias](#)).*

3) *Alternative models of Hybrid Inflation. This research was carried out by members of the Univ. of Thessaloniki ([Lazarides](#)).*

Training/Transfer of Knowledge

The Greek node participated (Tamvakis, Papantonopoulos) in organizing the First Network Meeting that took place in the island of Lesbos during the week 23/9/07 and 30/9/07. It was attended by a large number of participants (160), out of which about half were students. The lectures were excellent and very well attended. There were short talks by the young researchers that were very stimulating. The success of the meeting has promoted considerably the overall training goals of the Network. The school/meeting was attended by the node members Tamvakis, Papantonopoulos, Rizos, Leontaris, Zuleta and most of our graduate students.

Node members have attended various meetings related to the subjects of the network ([Planck 2008 in Barcelona](#)(Tamvakis, Zuleta, Tetradis), [String Phenomenology Institute at CERN](#)(Tamvakis, Rizos, Tetradis), [Strings at CERN](#) (Leontaris, Tamvakis)), [Black Hole Institute at CERN](#) (Kanti).

The Ioannina group hired two ER's, namely Dr Katarzyna Zuleta and Dr N. Chatillon, with contracts starting on October 1st 2007. Dr Zuleta is actively involved in collaboration with Ioannina group members. In particular, she is investigating localized black hole solutions in an RS background in the presence of bulk matter. In addition, she is investigating the cosmology of thick branes in collaboration with R. Gregory (Durham).

Dr Chatillon's contract was terminated on June 1st 2008. An ER position with a duration of 16 months beginning next November has been posted.

The list of publications (acknowledging the Network) that have resulted from this research effort since the beginning of the Network follow at the end. There are about 300 citations to these papers.

Papers Among Different Nodes

1) *Scalar Emission in the Bulk in a Rotating Black Hole Background*, S. Creek (Durham), O. Efthimiou (Ioannina), P. Kanti (Durham & Ioannina), K. Tamvakis (Ioannina). Phys.Lett.B656:102-111,2007.

2) *Greybody factors in a rotating black-hole background. II. Fermions and gauge bosons*, S. Creek (Durham), O. Efthimiou (Ioannina), P. Kanti (Durham & Ioannina), K. Tamvakis (Ioannina). Phys.Rev.D76:104013,2007.

3) *Greybody factors for brane scalar fields in a rotating black-hole background*, S. Creek (Durham), O. Efthimiou (Ioannina), P. Kanti (Durham & Ioannina), K. Tamvakis (Ioannina). Phys.Rev.D75:084043,2007.

4) *Smoothly evolving supercritical-string dark energy relaxes supersymmetric-dark-matter constraints*, A.B. Lahanas (Athens U.), N.E. Mavromatos (King's Coll. London), Dimitri V. Nanopoulos (Texas A-M. Phys.Lett.B649:83-90,2007.

5) *Dynamics of domain walls for split and runaway potentials*, Z. Lalak (Warsaw), S. Lola (Patras), P. Magnowski (Warsaw).
arXiv:0710.1233 (hep-ph).

6) *CP and Lepton-Number Violation in GUT Neutrino Models with Abelian Flavour Symmetries*, John R. Ellis (CERN), Mario E. Gomez (Huelva U.), Smaragda Lola (Patras).JHEP 0707:052,2007.

Papers Among Members of the Same Node with/or without Third Parties

1) *Pseudo-3-branes in a curved 6D bulk*, C. Bogdanos (Ioannina), A. Kehagias (NTU Athens), K. Tamvakis (Ioannina), *Phys.Lett.B*656:112-118,2007.

2) *Synergistic Gravity and the Role of Resonances in GRS-Inspired Braneworlds*, C. Bogdanos, A. Dimitriadis, K. Tamvakis (Ioannina). *Class.Quant.Grav.*25:045008,2008.

3) *Cosmic Acceleration Data and Bulk-Brane Energy Exchange*, C. Bogdanos, S. Nesseris, L. Perivolaropoulos, K. Tamvakis (Ioannina). *Phys.Rev.D*76:083514,2007.

- 4) *Testing GRBs as Standard Candles*. S. Basilakos, L. Perivolaropoulos, arXiv:0805.0875 (astro-ph).
- 5) *Vacuum energy, the cosmological constant, and compact extra dimensions: Constraints from Casimir effect experiments*, Leandros Perivolaropoulos (Ioannina). Phys.Rev.D77:107301,2008.
- 6) *Comparison of Standard Ruler and Standard Candle constraints on Dark Energy Models*, R. Lazkoz, S. Nesseris, L. Perivolaropoulos (Ioannina). arXiv:0712.1232 (astro-ph).
- 7) *Testing Lambda CDM with the Growth Function $\delta(a)$: Current Constraints*, S. Nesseris, Leandros Perivolaropoulos (Ioannina). Phys.Rev.D77:023504,2008.

- 8) *Reconstruction of the Scalar-Tensor Lagrangian from a LCDM Background and Noether Symmetry*, S. Capozziello (Naples) , S. Nesseris, L. Perivolaropoulos (Ioannina). JCAP 0712:009,2007.
- 9) *Can $f(R)$ Modified Gravity Theories Mimic a LCDM Cosmology?* , S. Fay (Queen Mary.) , S. Nesseris, L. Perivolaropoulos (Ioannina). Phys.Rev.D76:063504,2007.
- 10) *Tension and Systematics in the Gold06 S_{nl}a Dataset*, S. Nesseris, Leandros Perivolaropoulos (Ioannina). JCAP 0702:025,2007.
- 11) *The Limits of Extended Quintessence*, S. Nesseris, Leandros Perivolaropoulos (Ioannina). Phys.Rev.D75:023517,2007.

12) *Crossing the Phantom Divide: Theoretical Implications and Observational Status*, S. Nesseris, Leandros Perivolaropoulos (Ioannina). JCAP 0701:018,2007.

13) *Can Solar Neutrinos be a Serious Background in Direct Dark Matter Searches?* , J.D. Vergados (Cyprus & Ioannina) , H. Ejiri (Osaka & Prague), arXiv:0805.2583[hep-ph].

14) *BTZ Like-String on Codimension-2 Braneworlds in the Thin Brane Limit*, Bertha Cuadros-Melgar (Chile U, Santiago), Eleftherios Papantonopoulos, Minas Tsoukalas, Vassilios Zamarias (NTU Athens) Phys.Rev.Lett. 100:221601,2008.

16) *Induced cosmology on a regularized brane in six-dimensional flux compactification*, Eleftherios Papantonopoulos (NTU Athens), Antonios Papazoglou (APC, Paris & Paris U. VI, GRECO), Vassilios Zamarias (NTU Athens) Nucl.Phys.B797:520-536,2008.

17) *UV stable, Lorentz-violating dark energy with transient phantom era*, Maxim Libanov, Valery Rubakov (Moscow, INR), Eleftherios Papantonopoulos (NTU Athens), M. Sami (Jamia Millia Islamia), Shinji Tsujikawa (Gunma Coll. Tech.). JCAP 0708:010,2007.

18) *Regularization of conical singularities in warped six-dimensional compactifications*, Eleftherios Papantonopoulos (NTU Athens), Antonios Papazoglou (APC, Paris & Paris U. VI, GRECO & IPT, Lausanne), Vassilios Zamarias (NTU Athens), JHEP 0703:002,2007.

19) *Semi-shifted hybrid inflation with B-L cosmic strings*, George Lazarides, Iain N.R. Peddie, Achilleas Vamvasakis (Thessaloniki), arXiv:0804.3661 [hep-ph]

20) *Standard-smooth hybrid inflation.*, George Lazarides, Achilleas Vamvasakis (Thessaloniki), Phys.Rev.D76:123514,2007.

- 21) *Hybrid inflation followed by modular inflation*, George Lazarides (Thessaloniki) Int.J.Mod.Phys.A22:5747-5759,2008.
- 22) *New smooth hybrid inflation*, George Lazarides, Achilleas Vamvasakis (Thessaloniki), Phys.Rev.D76:083507,2007.
- 23) *Reducing the spectral index in F-term hybrid inflation through a complementary modular inflation*, George Lazarides (Thessaloniki) , C. Pallis (Manchester U.), Phys.Lett.B651:216-223,2007.
- 24) *Radiative gravitino decays from R-parity violation*, S. Lola (Patras), P. Osland, A.R. Raklev (Bergen) . Phys.Lett.B656:83-90,2007.