Quevedo Hernando

Position: Visiting Professor

Period covered: November 17, 2008 – November 16, 2009

I Scientific Work

- Investigation of exact solutions of Einstein's equations with multipole moments and their application for the description of the gravitational field of astrophysical objects.

- Analysis of repulsive gravity to determine the minimum size of astrophysical compact objects.

- Analysis of repulsive gravity to study the structure of accretion disks around naked singularities.

- Application of geometrothermodynamics in the context of black hole thermodynamics.

- Application of topological quantization in the case of mechanical systems with a finite number of degrees of freedom

II Conferences and educational activities

Conferences and Other External Scientific Work

- Sobral Meeting, (Fortaleza, Brazil), May 26 – 28, 2009

- Sixth Italian-Sino Workshop, (Pescara, Italy), June 29 – July 1, 2009

- Second Italian-Pakistani Workshop, (Pescara, Italy), July 8 – 10, 2009

- Marcel Grosmann Meeting, (Paris, France), July 12 – 18, 2009

- First Galileo – Xu Guangqi Meeting, (Shanghai, China), October 26 – 30, 2009

- Eleventh Italian-Korean Meeting, (Seoul, Korea), November 2 – 4, 2009

Visits to other universities:

- University of Cologne (Germany), July 20 – 25, 2009
- University of Barcelone (Spain), July 26 – 31, 2009

Work With Students (ICRANet students)

- Kuantay Boshkayev
  Topic: Exact and approximate metrics in astrophysics

- Orlando Luongo
  Topics: Geodesic motion in a mass-quadrupole field
  Cosmological models in modified theories of gravity

- Daniela Pugliese
  Topic: Study of circular motion around naked singularities

- Safia Taj
  Topic: Geometrothermodynamics of black holes

Diploma thesis supervision (UNAM students):

- Jose Alvarez (PhD)
  Topic: Statistical models for black holes

- Francisco Hernandez (PhD)
  Topic: Holography in field theories

- Francisco Nettel (PhD)
  Topic: Topological quantization in string theory

- Leticia Plascencia (MSc)
  Topic: Statistical models in geometrothermodynamics

- Moices Rodriguez (PhD)
  Topic: Topological quantum mechanics

- Alejandro Vazquez (PhD)
  Topic: Variational principles in geometrothermodynamics

Work With Postdocs

- Andrea Geralico (ICRANet)
  Topic: Geodesic motion in a mass-quadrupole field

- Alberto Sanchez (UNAM)
  Topic: Geometrothermodynamics and statistics of black holes

2009 List of Publications

Geometric description of BTZ black holes thermodynamics.
Hernando Quevedo, Alberto Sanchez
Published in Phys.Rev.D79:024012,2009.
Geometrothermodynamics of black holes in two dimensions.
Hernando Quevedo, Alberto Sanchez
Published in Phys.Rev.D79:087504,2009.

Generalized Kerr spacetime with an arbitrary mass quadrupole moment: geometric properties vs particle motion.
Donato Bini, Andrea Geralico, Orlando Luongo, Hernando Quevedo,
Published in Class.Quant.Grav.26:225006,2009.

Gravitational fields as generalized string models.
Francisco J. Hernandez, Francisco Nettel, Hernando Quevedo
Published in Grav.Cosmol.15:109-120,2009.

Topological spectrum of mechanical systems
Francisco Nettel, Hernando Quevedo, Moices Rodriguez
To be published in Rep.on Math.Phys., 2009

Topological quantization of the harmonic oscillator
Francisco Nettel, Hernando Quevedo
To be published in Int.J.Pure Appl. Math., 2009

Papers submitted or in preparation

Exact and approximate solutions of Einstein's equations for astrophysical compact objects
K. Boshkayev, H. Quevedo and R. Ruffini

On the minimum size of astrophysical compact objects
R. Kerr, H. Quevedo and R. Ruffini

Circular motion of test particles in Reissner-Nordstrom spacetime
D. Pugliese, H. Quevedo and R. Ruffini

Cosmological tests of the Horava-Lifshitz gravity model
O. Luongo and H. Quevedo

Geometrothermodynamics of higher dimensional black holes in Einstein-Gauss-Bonnet theory
H. Quevedo and S. Taj

Thermodynamic systems as extremal hypersurfaces
A. Vazquez, H. Quevedo, A. Sanchez

Invariant geometry of the ideal gas
A. Vazquez, H. Quevedo, A. Sanchez

Statistical thermodynamics of economic systems
H. Quevedo and M.N. Quevedo