

## Zalaletdinov Roustam M.

Position: Professor

Period covered: 1 July 2007 – 30 June 2008



### I Scientific Work

#### **Cosmology and Macroscopic Gravity**

1. Analysis of the structure of the system of macroscopic gravity equations with one connection correlation tensor.
2. Development of analytic methods for the exact solving of the macroscopic gravity equations.
3. Exact cosmological solutions of the macroscopic gravity by the computer algebra methods using The MG Eqs Code developed by R. van den Hoogen and R.M. Zalaletdinov (2005-2007).

#### **Foundations of the Kaluza-Klein Theory**

(in collaboration with Dr. Giovanni Montani and Francesco Cianfrani, University of Rome, Rome, Italy):

1. Formulation of the Kaluza-Klein theory by a compactification scheme based on averaging out the extra dimensions.

#### **Physical Applications of the non-Riemannian Geometry with an Asymmetric Metric**

(in collaboration with Dr. Giovanni Montani and Orchidea Maria Lecian, University of Rome, Rome, Italy):

1. Study on physical implications of the classification of the non-Riemannian geometry with an asymmetric metric in the spirit of Schouten proposed earlier.

#### **Gravitational Waves in the Inhomogeneous Lemaitre-Tolman space-time**

(in collaboration with Dr. Giovanni Montani and Dr. Massimiliano Lattanzi, University of Rome, Rome, Italy and University of Oxford, Oxford, UK):

1. Development of a formalism for the description of gravitational waves propagating on the inhomogeneous Lemaitre-Tolman background.

## II Conferences, Educational and Scientific Activities

### Conferences

1. Astrophysics at  $z > 6$ , 4<sup>th</sup> Italian-Sino Meeting, ICRA Net Coordinating Center, Pescara, Italy, July 20 - 28, 2007.
2. A Century of Cosmology - Past, Present and Future, San Servolo, Venice. Italy, August 27 - 31, 2007.
3. The Second Stueckelberg Workshop, ICRA Net Coordinating Center, Pescara, Italy, September 3 - 7, 2007 - plenary lecture, session chairperson.

### External Scientific Activity

1. Referee of the General Relativity and Gravitation Journal (USA), Classical and Quantum Gravity Journal (UK), Journal of Physics A: Mathematical and Theoretical (UK), The European Physical Journal B (France).
2. Assistance to the Editor of the International Journal of Modern Physics D (Singapore).

### The European Academy of Sciences, Physics and Earth Science Division, Brussels, Belgium, EU

1. Academician of the European Academy of Sciences and a nominated Elector for the Physics and Earth Science Division.

## III 2007-2008 List of Publications

R. Zalaletdinov, Averaging problem in cosmology and macroscopic gravity, Online Proceedings of the Atlantic Regional Meeting on General Relativity and Gravitation, Fredericton, NB, Canada, May 2006, ed. R.J. McKellar (<http://www.math.unb.ca/atgr/>, University of New Brunswick, Fredericton, 2006), 23 p.; e-print gr-qc/0701116 (2007), 23 p.

B.J. Ahmedov, R.M. Zalaletdinov, Z.Ya. Turakulov, S.N. Nuritdinov, K.T. Mirtadjieva, Relativistic astrophysics and cosmology in Uzbekistan, in: The International Astronomical Union Proceedings, Astronomy for the Developing World, IAU Special Session no.5, Prague, Czech Republic, August 2006, eds. J.B. Hearnshaw and P. Martinez (Cambridge University Press, Cambridge, 2007) p. 159-166.

S. Casanova, O.M. Lecian, G. Montani, R. Ru\_ni and R. Zalaletdinov, Extended Schouten classification for non-Riemannian geometries, Modern Physics Letters A, Vol. 23, No. 1 (2008) p. 17-23; e-print arXiv:0712.3716 [gr-qc] (2007), 7 p.

R. Zalaletdinov, The averaging problem in cosmology and macroscopic gravity, in: Proceedings of The Second Stueckelberg Workshop, ICRA Net Coordinating Center, Pescara, Italy, September 2007, International Journal of Modern Physics A, Vol. 23, No. 8 (Special Issue) (2008), p. 1173 - 1181; e-print arXiv:0801.3256v2 [gr-qc], 8 p.