

Belinski Vladimir

Position: member of ICRANet Faculty Staff

Period covered: 1990-2007 (INFN)

2007– present (ICRANet)



I Scientific Work

Cosmology: The study of the general solution of gravitational equations with cosmological singularity of an oscillatory chaotic structure (the so-called BKL singularity). Investigation of the properties of this solution and of the influence of different kinds of matter on its character.

Astrophysics: Construction of exact solutions for the motions of gravitating shells and its intersections. Chaotic behaviour of the intersecting shells. Applications to the stellar clusters.

Exact solutions of Einstein and Einstein-Maxwell equations: the theory of gravitational solitons and the mathematical aspects of the Inverse Scattering Method in General Relativity. Constructions of the exact solutions of physical interest.

Quantum Fields: Analysis of the behaviour of the Quantum Fields in Black Hole space-time and in accelerated systems from the point of view of canonical and algebraic Quantum field Theory.

II Conferences and educational activity

The 10th Italian Conference on General Relativity and Gravitational Physics, Bardonecchia, Italy, September 1-5, 1992. Invited Talk "Gravitational Topological Charge and Gravibreather". Proceedings ed. M.Cerdonio et al., page 37, World Scientific, (1994).

International Conference "Birth of the Universe and Fundamental Physics", Rome, May 1994. Invited talk "Gravitational Topological Charge". Lectures Notes in Physics, vol. 455, ed. F. Ochionero, Springer, (1995).

The Seventh Marcel Grossman Meeting (MG7), Stanford, USA, July 24-30, 1994. Chairman of the "Exact solutions" parallel session. Two talks: (i) Plenary talk "Gravitational Topological Charge and the Gravibreather" and (ii) parallel session talk "On the existence of black hole evaporation".

The Eighth Marcel Grossman Meeting (MG8), Jerusalem, Israel, June 22-27, 1997. . Chairman of the “Quantum Fields in Curved Space Time” parallel session. Two parallel sessions talks: “On the turbulence near cosmological singularity” (together with A.Kirillov and G.Montani) and “On the theory of the Unruh effect” (together with B.Karnakov, V.Mur and N.Narozhny).

The Third ICRANet Workshop “Electrodynamics and Magnetodynamics around Black Holes”, Rome-Pescara, July 12-24, 1999. The talk “Quantum Field in Rindler space” (together with N..Narozhny, A.Fedotov, B.Karnakov and V.Mur).

International European Conference “Journées Relativistes 99”, Weimar, Germany, September 12-17. Plenary talk: “Quantum Fields in Accelerated Frames” (together with N. Narozhny, A. Fedotov, B Karnakov and V. Mur), Ann. Phys. (Leipzig), vol.9 p. 199 (2000).

The Second ICRA Network Workshop “The Chaotic Universe”, Rome-Pescara, February 1-5, 1999. The talk “Chaos in Cosmology”.

The Third ICRANet Workshop “Electrodynamics and Magnetodynamics around Black Holes”, Rome- Pescara, July 12-24, 1999. The talk: “Quantum Field in Rindler space” (together with N. Narozhny, A. Fedotov, B Karnakov and V. Mur)

The Ninth Marcel Grossman Meeting (MG9), Rome, July 2-8, 2000. Chairman of the “Quantum Fields” parallel session.

The Tenth Marcel Grossman Meeting (MG10), Rio de Janeiro, July 20-26, 2003. Chairman of the “Quantum Fields” parallel session.

The 8th Italian-Korean Symposium on Relativistic Astrophysics, Rome-Pescara, August 18-23, 2003. The talk “Boundary conditions in the Unruh problem”

The 1st Italian-Sino Workshop on Cosmology and Relativistic Astrophysics, Rome-Pescara, July 7-17, 2004. The talk on the chaotic motion of the gravitating shells.

The 2nd Italian-Sino Workshop on Relativistic Astrophysics, Pescara, June 10-20, 2005. The talk “On the equilibrium state for two charged masses in General Relativity”.

The 9th Italian-Korean Symposium on Relativistic Astrophysics, Seoul, July 19-24, 2005. Invited talk “On the equilibrium state for two charged masses in General Relativity”.

The Bego Scientific Recontres, Nice, February 6-17, 2006. Three invited lectures on the black hole evaporation phenomenon.

The 3rd Italian-Sino Workshop on Relativistic Astrophysics, Pescara, June 10-20, 2006. The talk “Equilibrium configuration of two charged masses in general Relativity” (together with G. Alekseev)

The 1st Stueckelberg Workshop on Relativistic Field Theories, Pescara, June 25-July 1, 2006. The talk “New developments in Einstein-Maxwell Theory: non-perturbative approach”.

Eleventh Marcel Grossman Meeting (MG11), Berlin, July 23-29, 2006. Chairman of the “Quantum Fields” parallel session. Invited review paper for Proceedings: G. Alekseev and V. belinski “Superposition of Fileds of two Reissner-Nordstrom Sources”, in press.

XII Brazilian School in Gravitation and Cosmology, Rio de Janeiro, September 2006. Five invited lectures under the title “Quantum fields in black hole spacetime and in accelerated systems”.

Workshop “Key Problems in Theoretical Cosmology”, April 23-28, 2007, Cargese, Institut D’Etudes Scientifiques De Cargese. Invited talk on the exact solution for the equilibrium configuration of two static Reissner-Nordstrom sources (together with G. Alekseev).

The 10th Italian-Korean Symposium on Relativistic Astrophysics, Pescara, June 25-30, 2007. Talk on the static equilibrium state of two Reissner-Nordstrom sources (together with G. Alekseev)

The 4th Italian-Sino Workshop on Relativistic Astrophysics, Pescara, July 20-30, 2007. Talk on the electric force lines in the equilibrium configuration of two Reissner-Nordstrom sources (together with G. Alekseev, A. Paolino and M.Pizzi).

The 5th Sino-Italian Workshop on Relativistic Astrophysics, Taiwna, May 28-June 1, 2008. talk “Charged membrane as a source for repulsive gravity”.

The 3rd Stueckelberg Workshop on relativistic Astrophysics, Pescara, 8-18 July, 2008. The talk “Charged Masses and repulsive Gravity” (together with M. Pizzi and A. Paolino).

XIII Brazilian School in Gravitation and Cosmology, Rio de Janeiro, July 20-August 1, 2008. Five invited lectures under the title “Einstein.Maxwell solitons”.

Work with students and Diploma thesis Supervision:

1. G.Montani (University Graduation, 1992)
2. W. Inglese (University Graduation, 1992)
3. A.D’Aquino (University Graduation, 1993)
4. F.Ferrante (University Graduation, 1996)
5. G.Montani (PhD degree, 1997)
6. M.Talevi (University Graduation, 1997)
7. A.Paolino (University Graduation, 1997)
8. A.Borreli (PhD degree, 1998)
9. D.Oriti (University Graduation, 1999)
10. M.Vella (University Graduation, 2000)
11. D.Colosi (University Graduation, 2000)

12. F.Briscese (University Graduation, 2003)
13. M.Pizzi (University Graduation, 2005)
14. M.Pizzi (PhD degree, in progress)
15. A.Paolino (PhD degree, in progress)

Other teaching activity

The course of lectures in Cosmology for the PhD students delivered in Physics Department, Rome University "La Sapienza" during 1990-1998.

III Service Activities

Coordination of the collaboration between ICRANet and Russian physicists.

IV 2007-2008 List of Publications

V. Belinski "Quantum **fields** in black hole spacetime and in accelerated systems", AIP Conference Proceedings, Ed. M.Novello and S. Bergliaffa, 910, 270, (2007).

G.Alekseev and V.Belinski "Schwarzschild Black Hole Hovering in the Field of a Reissner-Nordstrom Naked Singularity", Nuovo Cimento, 122B, No.2, (2007).

G.Alekseev and V.Belinski ""Equilibrium configurations of two charged masses in General Relativity", Phys. Rev. D76, 021501(R), (2007).

G.Alekseev and V.Belinski "Superposition of fields of two Reissner-Nordstrom sources", Invited paper for Proceedings of 11 Marcel Grossmann Meeting (Berlin, July 2006), World Scientific, pub. date September 2008.

V.Belinski, M.Pizzi and A.Paolino "Charged membrane as a source for repulsive gravity" IJMP(D), in press (2008).

V. Belinski "Einstein-maxwell solitons", AIP Conference Proceedings, Ed.M.Novello and S. Bergliaffa, in press, to appear in 2009.