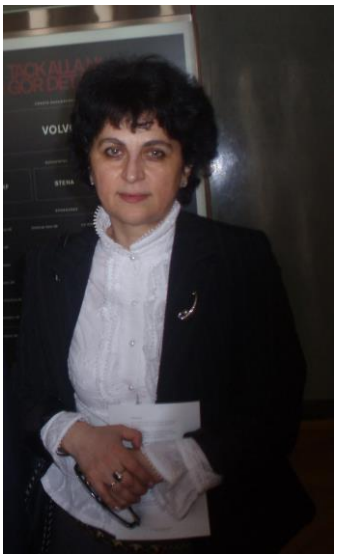

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Astrophysics

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Senior Research Scientist, TSU Andronikashvili Institute of Physics

Education / Qualifications / Scientific Degrees

- **Doctor of Phys. Math. Sciences**, Andronikashvili Institute of Physics, Georgia - 2005
- **PHD** (Candidate of Phys. Math. Sciences) in Theoretical Physics, Tbilisi State University – 1986.
- **MSc in Physics** (Physical Hydrodynamics), *with honor* – 1980
- **Accompanying piano player**, Tbilisi State Conservatory High School (*piano*) - 1976

Career History

2009 – p.t. **Professor/Full Professor (Astrophysics),** Department of Physics, Faculty of Exact and Natural Sciences (FENS). Tbilisi State University (TSU). *Chair of Astrophysics since 2013.*

2016 – p.t. **Head of PHD dissertation defense council in Physics**, FENS, TSU.

2008 – p.t **Head of Quality Assurance Service at the Department of Physics,** FENS, TSU.

2010 – p.t **Coordinator and Head of MSc Program "Fundamental Physics".**

2008 – p.t **Co-Head of program for BSc in Physics,** FENS, TSU;
Head of MSc "Fundamental Physics" program study module "Astrophysics and Plasma Physics, Faculty of Exact and Natural Sciences. Tbilisi State University;
Head of PHD program "Physics" (study module "Astrophysics); **PHD program "Plasma Physics and Astrophysics".** FENS, TSU.

2006 – 2009 **Associate professor,** Faculty of Exact and Natural Sciences. Tbilisi State University.

2005 – p.t. **Senior Research Scientist**, Department of Plasma Physics, Andronikashvili Institute of Physics, TSU, Georgia.

1994 - 2005 **Senior Research scientist**, Department of Plasma Physics, Faculty of Physics. TSU.

2001 - 2002 **Visiting Professor** at High Temperature Plasma Center at the University of Tokyo, **Japan**.

1999-2006 **Invited Assoc. Prof./ Invited Prof.** at Faculty of Physics, Tbilisi State University, Georgia.

11/1995 - 10/1996 **Profesora Visitante**, Departamento de Fisica, Faculdad de Ciencias, Universidad De Alcala, Alcala de Henares, Madrid, **Spain**.

3/1991 - 5/1991 **Visiting Scientist**, Department of Physics, University of British Columbia, UBC, Vancouver, **Canada**.

1988 - 1993 **Senior Research Scientist**, Quantum Electronics Laboratory, Faculty of Physics. TSU.

1980 - 1987 **Junior Research Scientist**, Dept. of Nuclear Physics, Faculty of Physics, TSU.

Awards

2011 – 2017 **Senior Associate** at The Abdus Salam International Centre for Theoretical Physics (AS **ICTP**). Trieste, **Italy.**

1998 - 2010 **Regular Associate** at The Abdus Salam International Centre for Theoretical Physics (AS **ICTP**). Trieste, Italy *(renewal of award for the period of 2004 – 2009, extended till 31.12.2010).*

1993 The **American Physical Society Grant** (founded for FSU scientists / individuals).

1978 – 1980 The **Lenin Stipend** (highest merit scholarship in USSR) at Tbilisi State University.

1977 – 1978 The **Rustaveli Stipend** (merit scholarship) at Tbilisi State University.

Courses

- Radiation Theory (MSc)
- MHD I, II (MSc)
- Solar Physics (MSc)
- Relativistic Plasma (MSc)
- Fluid Dynamics (BSc)
- Electrodynamics of Continuous Media (BSc)
- Fields Theory (Classical) (BSc)
- Electromagnetism (BSc)

Research Interests

- Theoretical Plasma Astrophysics
- Nonlinear MHD; Magneto-Fluid Coupling Theory
- Solar Physics
- Stellar Atmospheres Physics
- Physics of Disk-Jet Systems
- Physics of Compact Objects
- Relativistic Plasma Dynamics
- Magnetic Field and Flow/Outflow/Jet Generation in Astrophysical conditions

Main proposed/constructed theories:

Conjecture & model for: **Closed Structure Primary Heating** *as well as* **the Flow Acceleration / Generation in Stellar Atmospheres** *[with S.M. Mahajan (IFS, University of Texas at Austin, USA) & Z. Yoshida (The University of Tokyo)]*

Model for **Large-scale magnetic field generation** [*with S.M. Mahajan* & V.*I. Berezhiani* (*Andronikashvili Institute of Physics*)]

Theory for **Generalized Beltrami Flow Modeling a Disk-Jet system** *[with Z. Yoshida]*

Theory for **Nonlinear Landau damping phenomenon in a strongly turbulent plasma** *[with N.L. Tsintsadze]*

Current Projects

- The Solar Wind and the Solar Corona formation and heating.
- Dense Plasma Dynamics in Connection with Structure Formation in Compact Astrophysical Objects.
- Disk-Jet structure formation.
- Fast flow/jet-like outflow generation and their escape is Stellar Atmospheres.

Selected Publications

1. **N.L. Shatashvili,** S.M. Mahajan and V.I. Berezhiani. *Mechanisms for Multi-Structures in Dense Degenerate Astrophysical Plasmas.* ***Astrophys. & Space Sci.*** **361(2),** 70 (2016).
2. V.I. Berezhiani, **N.L. Shatashvili,** S.M. Mahajan**.** Beltrami-Bernoulli Equilibria in Plasmas with Degenerate Electrons. ***Phys. Plasmas*** **22(2),** 022902 (2015).
3. V.I. Berezhiani, **N.L. Shatashvili**, N.L. Tsintsadze. Electromagnetic Solitons in Degenerate Relativistic Electron-Positron Plasma. ***Physica Scripta*****, 90(6)**, 068005 (2015).
4. V.I. Berezhiani, **N.L. Shatashvili**, S.M. Mahajan and B.N. Aleksic. Vortex bubble formation in pair plasmas. ***Phys. Rev. E.*** **88**. 015101 (2013).
5. **N.L. Shatashvili** and Z. Yoshida. Generalized Beltrami field modeling disk-jet system. **AIP** ***Conf. Proc.*** **1392,** 73-82 (2011).
6. S.M. Mahajan, **N.L. Shatashvili** and V.I. Berezhiani**.** Asymmetry Driven Structure Formation in Pair Plasmas. ***Phys. Rev. E*****, 80(6),** 066404 (2009).
7. S.M. Mahajan and **N.L. Shatashvili.** Wave Localization and Density Bunching in Pair Ion Plasmas. ***Phys. Plasmas***, **15 (10**), pp. 100701 (2008).
8. V.I. Berezhiani & **N.L. Shatashvili.** On the "Vacuum Heating" of Plasma in the Field of Circularly Polarized Laser Beam. ***Europhys. Letters***, **76(1)**, 70–73 (2006).
9. S.M. Mahajan, **N.L. Shatashvili**, S.V. Mikeladze & K.I. Sigua. Acceleration of Plasma Flows in the Closed Magnetic Fields – Simulation and Analysis. ***Phys. Plasmas.*** **13**, 062902 (2006).
10. S.M. Mahajan, **N.L. Shatashvili**, S.V. Mikeladze & K.I. Sigua. Acceleration of Plasma Flows Due to Reverse Dynamo Mechanism. ***The Astrophys. J.*** **634**, 419-425 (2005).
11. S.M. Mahajan, K.I. Nikol'skaya, **N.L. Shatashvili** & Z. Yoshida. Generation of Flows in the Solar Chromosphere Due to Magneto-Fluid Coupling. ***The Astrophys. J. Letters***, **576**, L161 (2002).
12. S. Ohsaki, **N.L.Shatashvili**, Z. Yoshida and S.M. Mahajan. Energy Transformation Mechanism in the Solar Atmosphere Associated with the Magnetofluid Coupling: Explosive and Eruptive Events. ***The Astrophys. J.*****, 570**, 395 (2002).
13. S.M. Mahajan, R.Miklaszewski, K.I. Nikol'skaya **N.L. Shatashvili** The Coronal Hole Creation: Theory and Simulation. ***Adv. Space Res.***, **30**, No.3, 371 – 376 (2002).
14. S. Ohsaki, **N.L.Shatashvili**, Z. Yoshida and S.M. Mahajan. Magnetofluid Coupling: Eruptive Events in the Solar Corona. ***The Astrophys. J. Letters***, **559**, L61 (2001).
15. S.M. Mahajan, R.Miklaszewski, K.I. Nikol'skaya & **N.L. Shatashvili.** Formation and Primary Heating of the Solar Corona - Theory and Simulation. ***Phys. Plasmas***. **8**, 1340 (2001).
16. **N.L. Shatashvili** & N.N. Rao. Localized Nonlinear Structures of Intense Electromagnetic Waves in Two-Electron-Temperature Electron-Positron-Ion Plasmas**.** ***Phys. Plasmas***. **6**, No.1, 66 (1999).
17. V.I. Berezhiani, S.M. Mahajan & **N.L. Shatashvili**. Theory of Magnetic Field Generation by Relativistically Strong Laser radiation. ***Phys. Rev.*** **E 55**, 995 (1997).
18. **N.L. Shatashvili**, J.I. Javakhishvili & H. Kaya. Nonlinear Wave Dynamics in Two-Temperature Electron-Positron-Ion Plasma. ***Astrophys. & Space Sci.*** **250**, 109 (1997).
19. K.I. Sigua, N.L. Tsintsadze & **N.L.Shatashvili**. The Langmuir Wave Dynamics in Strong Magnetic Fields and Generation of Whistler Waves. ***Sov. J. Plasma Phys***. **12(9)**, 591 (1986).
20. **N.L. Shatashvili** & N.L. Tsintsadze. Nonlinear Landau Damping Phenomenon in a Strongly Turbulent Plasma. ***Physica Scripta***, **T2/2**, 511 (1982).