

CURRICULUM VITAE

Surname Chagelishvili
First name George
Date and place of birth 03 December 1952, Kutaisi, Georgia
Telephone : +995 32 2235070 / +995 599 553720
E-mail g.chagelishvili@astro-ge.org georgech123@yahoo.com

Education

Master in Physics 1974 Tbilisi State University
Academic Degrees:
Ph. D. 1979 Institute of Physics of Georgian Academy of Sciences (GAS)
Doctor of Science 1990 Tbilisi State University

Career/Employment

1974-1977, Ph. D. Student, Institute of Physics of GAS
1978-1986, Junior Research Scientist, Abastumani Astrophysical Observatory of GAS,
1986-1991, Senior Research Scientist, Abastumani Astrophysical Observatory of GAS
1991-1997, Leading Research Scientist, Abastumani Astrophysical Observatory of GAS
1997-2007 Nov., Principal Research Scientist, Abastumani Astrophysical Observatory of GAS
(Due to a reorganization of scientific institutions in Georgia. Abastumani Astrophysical Observatory became an institute of the Ilia State University in Nov. 2007)
2007 Nov.–now, Principal Research Scientist, Abastumani Astrophysical Observatory, Ilia State University
2009 Jan.–now, Principal Research Scientist, Institute of Geophysics, Tbilisi State University

Specialization fields

Plasma and fluid dynamics,
Astrophysics,
Nonlinear dynamics and self-organization,
Turbulence in flow systems

Current research interest

Nonlinear transverse cascade in shear flow subcritical turbulence;
Shear flow non-normality induced linear mode coupling;
Self-organization (including formation of spatio-temporal patterns) and turbulence:
- in HD/MHD plane shear flows,
- in differentially rotating, magnetised, stratified astrophysical disks
- in geophysical flows;
- in Fusion plasma.

Honours, Awards

- 2001 Corresponding Member of The Georgian Academy of Sciences;
- 2002 The Georgian National Award in Sciences and Technology.
- 2013 Academician of The Georgian National Academy of Sciences;

Grants

ISF	RVO 200
INTAS	Ge-97 0504
ISTC	G-553, G-1217
CRDF	GRDF-3315
NATO	EV-979038
DFG	GZ: 436, OB 96/21-1, OB 96/30-1
GNSF	ST08/4-420
DFG	Project number 261830592
GNSF	FR17-107

Collaborations

Osservatorio Astronomico di Torino, Italy

Observatoire de Paris-Meudon, France

Institute for Fusion Studies, the University of Texas at Austin, USA

Group of fluid dynamics, Department of Mechanical Engineering, TU Darmstadt, Germany

Group of fluid Mechanics, University of Siegen, Germany

Publications

- Number of papers in refereed journals: 110
- Number of communications to scientific meetings: 47
- Books: 1 (Chapter)

List of selected publications from 1997

1. Chagelishvili G., Chanishvili R., Lominadze J. and Tevzadze A., *Magnetohydrodynamic Waves Linear Evolution in Parallel Shear Flows: Amplification and Mutual Transformations*, Phys. Plasmas, 1997, **4**, 259
2. Chagelishvili G., Rogava A. and Tsiklauri D., *Compressible Hydromagnetic Shear Flows with Anisotropic Thermal Pressure: Non-modal Study of Waves and Instabilities*, Phys. Plasmas, 1997, **4**, 1182
3. Chagelishvili G., Khujadze G., Lominadze J. and Rogava A., *Acoustic Waves in Unbounded Shear Flows*, Phys. Fluids, 1997, **9**, 1955
4. Chagelishvili G. and Khujadze G., *On the Fluctuation Background of Incompressible Perturbations in Laminar Shear Flows*, JETP, 1997, **112**, 1
5. Chagelishvili G., Tevzadze A., Bodo G. and Moiseev S., *Linear mechanism of Wave Emergence from Vortices in Smooth Shear Flows*, Phys. Rev. Lett., 1997, **79**, 3178

6. Rogava A., Chagelishvili G. and Berezhiani V., *Velocity Shear Induced Effects on Electrostatic Ion Perturbations*, Phys. Plasmas, 1997, **4**, 4201
7. Rogava A., Chagelishvili G. and Mahajan S., *"Shear-Langmuir Vortexes": an elementary mode of plasma collective behavior*, Phys. Rev. E, 1998, **57**, 7103
8. Chagelishvili G., Tevzadze, A. and Goossens M., *Generation of oscillations in solar convection zone: linear mechanism of mode conversion in shear flows*, Proceedings of the conference: 9th European Meeting on Solar Physics, "Magnetic Fields and Solar Processes" (Florence, Italy 1999), ESA SP-448, 1999, p.75
9. Chagelishvili G., Tevzadze A., Gogoberidze G. and Lominadze J., *Discrete Coherent Amplification of Oscillations by Nonresonant Forcing*, Phys. Rev. Lett., 2000, **84**, 1619
10. Chagelishvili G., Chanishvili R. and Lominadze J., *A Model of Turbulence in Unbounded Smooth Shear Flows: Weak Turbulence Approach*, JETP, 2002, **94**, 434
11. Chagelishvili G., *New Linear Mechanisms of Acoustic Wave Generation in Smooth Shear Flows (Nonmodal Study)*, in: "Sound-Flow Interactions" (Lecture Notes in Physics, Springer), Eds. Y.Auregan, A. Maurel, V. Pagneux, J.-F. Pinton, 2002, p.210
12. Chagelishvili G., Zahn J-P., Tevzadze, A. and Lominadze J., *On Hydrodynamic Shear Turbulence in Keplerian Disks: From Transient Growth to Bypass Transition*, Astron. & Astrophysics, 2003, **402**, 401
13. Tevzadze, A., Chagelishvili G., Zahn J-P., Chanishvili R. and Lominadze J., *On Hydrodynamic Shear Turbulence in Keplerian Disks: Transient Growth of 3D Small Scale Perturbations*, Astron. & Astrophysics, 2003, **408**, 779
14. Kalashnik M., Mamatsashvili G., Chagelishvili G. and Lominadze J., *The dynamics of non-symmetric perturbations in geostrophic flows with a constant horizontal shear*, Dokladi Akad. Nauk, 2004, **399**, 1
15. Gogoberidze G., Chagelishvili G., Sagdeev R. and Lominadze J., *Linear coupling and over-reflection phenomena of MHD waves in smooth shear flows*, Physics of Plasmas, 2004, **11**, 4672
16. Gogoberidze G., Samushia L., Chagelishvili G., and Lominadze J. and Horton W., *Surface gravity waves in deep fluid at vertical shear flow*, JETP, 2005, **101**, 169
17. Bodo G., Chagelishvili G., Murante G., Tevzadze A., Rossi P. and Ferrari A., *Spiral density wave generation by vortices in Keplerian flows*, Astron. & Astrophysics, 2005, **437**, 9
18. Kalashnik M., Mamatsashvili G., Chagelishvili G. and Lominadze J., *Linear dynamics of non-symmetric perturbations in geostrophic horizontal shear flows*, Quarterly Journal of the Royal Meteorological Society, 2006, **132**, 505
19. Kim J., Perez J., Horton W., Chagelishvili G., Chanishvili R., Lominadze J. and Bowman J., *Self-sustaining vortex perturbations in smooth shear flows*, Physics of Plasmas, 2006, **13**, 062904
20. Khujadze G., Oberlack M. and Chagelishvili G., *Direct Numerical Simulation of Stochastically Forced Laminar Plane Couette Flow: Peculiarities of Hydrodynamic Fluctuations*, Phys. Rev. Lett., 2006, **97**, 034501
21. Bodo G., Tevzadze A., Chagelishvili G., Mignone A., Rossi P. and Ferrari A., *Stability and nonlinear adjustment of vortices in Keplerian flows*, Astron. & Astrophysics, 2007, **475**, 51

22. Mamatsashvili G. and Chagelishvili G., *Transient growth and coupling of vortex and wave modes in self-gravitating gaseous discs*, Monthly Notices of the Royal Astronomical Society, 2007, **381**, 809
23. Tevzadze, A., Chagelishvili G. and Zahn J-P., *Hydrodynamic stability and mode coupling in Keplerian flows: local strato-rotational analysis*, Astron. & Astrophysics, 2008, **478**, 9
24. Horton W., Correa C., Chagelishvili G., Avsarkisov V., Lominadze J., Perez J., Kim J-H. and Carter T.: *On generation of Alfvénic-like fluctuations by drift wave - zonal flow system in LAPD experiments*, Physics of Plasmas, 2009, **16**, 092102
25. Tevzadze A., Chagelishvili G., Bodo G. and Rossi P., *Linear coupling of modes in two-dimensional radially stratified astrophysical discs*, Monthly Notices of the Royal Astronomical Society, 2010, **401**, 901
26. Mamatsashvili G., Avsarkisov V., Chagelishvili G., Chanishvili R. and Kalashnik M., *Transient dynamics of nonsymmetric perturbations vs. symmetric instability in baroclinic zonal shear flows*, Journal of the atmospheric sciences, 2010, **67**, 2972
27. Horton W., Kim J-H., Chagelishvili G., Bowman J. and Lominadze J.G., *Angular redistribution of nonlinear perturbations: a universal feature of nonuniform flows*, Phys. Rev. E., 2010, **81**, id. 066304
28. Mamatsashvili G., Chagelishvili G., Bodo G. and Rossi P., *Revisiting dynamics of non-axisymmetric perturbations in weakly magnetized accretion discs*, Monthly Notices of the Royal Astronomical Society, 2013, **435**, 2552
29. Chagelishvili G., Khujadze G., Foysi H. and Oberlack M., *Spanwise reflection symmetry breaking and turbulence control: Plane Couette flow*, J. Fluid Mechanics, 2014, **745**, 300
30. Gogichaishvili D., Chagelishvili G., Chanishvili R. and Lominadze J., *Nature and dynamics of Alfvén waves overrefraction in MHD shear flows*, J. Plasma Physics, 2014, **80**, 667
31. Mamatsashvili G., Gogichaishvili D., Chagelishvili G. and Horton W., *Nonlinear transverse cascade and two-dimensional magnetohydrodynamic subcritical turbulence in plane shear flows*, Phys. Rev. E, 2014, **89**, 043101
32. Chkhetiani O, Kalashnik M. and Chagelishvili G., *Dynamics and Blocking of Rossby Waves in Quasi-Two-Dimensional Shear Flows*, JETP Letters, 2015, **101**, 79
33. Hau J-N., Chagelishvili G., Khujadze G., Oberlack M. and Tevzadze A., *A comparative numerical analysis of linear and nonlinear aerodynamic sound generation by vortex disturbances in homentropic constant shear flows*, Physics of Fluids, 2015, **27**, 126101
34. Mamatsashvili G., Dong S., Khujadze G., Chagelishvili G., Jiménez J. and Foysi H., *Homogeneous shear turbulence - bypass concept via interplay of linear transient growth and nonlinear transverse cascade*, Journal of Physics: Conference Series, 2016, **708**, id. 012001
35. Chanishvili R., Chagelishvili G., Uchava E. and Kharshiladze, O., *Linear coupling of planetary scale waves in ionospheric zonal shear winds: Generation of fast magnetic waves*, Physics of Plasmas, 2016, **23**, id.042109
36. Mamatsashvili G., Khujadze G., Chagelishvili G., Dong S., Jiménez J. and Foysi H., *Dynamics of homogeneous shear turbulence: A key role of the nonlinear transverse cascade in the bypass concept*, Phys. Rev. E, 2016, **94**, id.023111

37. Chagelishvili G., Hau J-N., Khujadze G. and Oberlack M., *Mechanical picture of the linear transient growth of vortical perturbations in incompressible smooth shear flows*, Phys. Rev. Fluids, 2016, **1**, id.043603
38. Hau J-N., Oberlack M. and Chagelishvili G., *On the optimal systems of subalgebras for the equations of hydrodynamic stability analysis of smooth shear flows and their group-invariant solutions*, Journal of Mathematical Physics, 2017, **58**, 043101
39. Gogichaishvili D., Mamatsashvili G., Horton W., Chagelishvili G. and Bodo G., *Nonlinear transverse cascade and sustenance of MRI- turbulence in Keplerian disks with azimuthal magnetic fields*, Astrophysical Journal, 2017, **845**, id. 70