

# Curriculum Vitae

**Name:** Anvar Shukurov

**Position:** Professor of Astrophysical Fluid Dynamics

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Personal web page: <http://www.mas.ncl.ac.uk/~nas13>

University web page: <http://www.ncl.ac.uk/math/staff/profile/anvar.shukurov>

**Born:** 28 December 1952 in Dushanbe, Tajikistan, former USSR

**Nationality:** Russian and British

**Marital status:** Married; one daughter (born in 1996)

## Education and academic degrees

Equivalent of Master's Degree in Theoretical Physics, [Physics Department, Moscow University](#), 1969–1975, Moscow, USSR.

Diploma Thesis: *Formation of Molecular Hydrogen in the Expanding Universe*, supervised by [Ya. B. Zeldovich](#) and T. V. Ruzmaikina.

Postgraduate Studentship, [Sternberg Astronomical Institute, Moscow University](#), 1978–1981.

PhD Thesis: *Generation of Magnetic Fields in the Galactic Disc*, supervised by [Ya. B. Zeldovich](#) & [A. A. Ruzmaikin](#). Degree awarded on 18/11/1982 in [Sternberg Astronomical Institute, Moscow University](#).

[Doctor of Physico-Mathematical Sciences](#) degree awarded on 11/06/1993 in [Astro-Space Centre, Lebedev Physical Institute](#), Russian Academy of Sciences, Moscow.

Thesis title: *Magnetic Fields of Galaxies*.

## Academic Career

1975–1978: Assistant Researcher, Institute of Astrophysics, [Tajik Academy of Sciences](#), Dushanbe, USSR

1975–1978: Research Associate, [Institute of Applied Mathematics](#), Academy of Sciences, Moscow, USSR

1978–1981: Postgraduate student, [Sternberg Astronomical Institute](#), Moscow University, Moscow, USSR

1981–1989: Assistant Researcher, then Researcher, [Space Research Institute \(IKI\)](#), Academy of Sciences, Moscow, USSR

1989–1992: Senior Researcher, [Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation \(IZMIRAN\)](#), Academy of Sciences, Troitsk, Moscow Region, Russia

1992–1996: Leading Researcher, [Research Computing Center](#), Moscow University, Moscow, Russia

1996–present: Lecturer (Reader after 1/08/99; Professor after 1/08/2002), [School of Mathematics and Statistics, University of Newcastle upon Tyne](#), United Kingdom

March 2005 – March 2008: appointed visiting professor, [IUCAA](#), Pune, India

Oct. 1990 – Jan. 1991: visiting researcher, CEA Saclay, CNRS, Gif sur Yvette, France

July 1993, May 1994, May 1995, April–July 2002, and February 2009: visiting researcher, [Max-Planck-Institut für Radioastronomie](#), Bonn, Germany

January–April 1994: visiting researcher, Mathematics Department, Manchester University, UK

October 1994: visiting researcher, High Altitude Observatory, NCAR, Boulder, Colorado, USA

December 2002–January 2003: visiting professor, IUCAA, Pune, India

2005–2010: a coordinator of Working Group 11 “GIS-Aided Mathematical Modelling” of the UNESCO IGCP Project 521 *Black Sea–Mediterranean Corridor during the last 30 kyr: sea level change and human adaptation* (<http://www.avalon-institute.org/IGCP/>)

2006–2010: the Coordinator of the EC FP6 Specific Targeted Research Project *The Formation of Europe: Prehistoric Population Dynamics and the Roots of Socio-Cultural Diversity* (FEPRE; <http://fepre.mas.ncl.ac.uk/>).

## Specialization

*Main fields:* Interstellar medium, Astrophysical magnetohydrodynamics, Dynamo theory

*Other fields:* Geophysics, Fluid dynamics, Turbulence

*Current research interests:* Magnetic fields of galaxies, Dynamo theory, Interstellar matter, Interstellar turbulence; Radiocarbon dating for archaeology, Prehistoric population dynamics

## Publications (see also <http://www.mas.ncl.ac.uk/~nas13/publist.pdf>)

Number of papers in refereed journals, invited reviews and book chapters: ca 130.

H-index: according to *Harzing’s Publish or Perish* (<http://www.harzing.com>), as on 6/02/2012 (30 papers with 30 or more citations).

Number of published communications at scientific meetings and unrefereed papers: ca 45.

Books: 2.

Edited volumes: 5.

## Membership of Professional Societies

Member of International Astronomical Union, Fellow of Royal Astronomical Society (UK), member of the LOFAR-UK Consortium (<http://www.lofar-uk.org/>).

## Research Grants since 1996

Sponsor & Title	Sum	Duration	PI	Co-Investigators
PPARC, The effects of magnetic fields on the structure of astrophysical discs	£286,055	1998–2002	A.Brandenburg, from 2000: A.Shukurov	C.F.Barengi, C.G.Campbell, A.Shukurov
PPARC Visiting Grant	£12,000	1997–1999	A.Shukurov	
PPARC Visiting Grant	£10,899	2001–2005	A.Shukurov	C.F.Barengi, C.G.Campbell, G.R.Sarson
NATO Collaborative Research Grant	£15,625	1996–1997	E.Zweibel	A.Brandenburg, K.Ferrière, D.Moss, A.Shukurov, D.D.Sokoloff
NATO Collaborative Linkage Grant	£9,900	1999–2002	D.Moss	P.G.Frick, A.Shukurov, D.D.Sokoloff
EU TMR Programme	£60,340	1997–1999	A.Brandenburg	A.Shukurov
Leverhulme Trust, Magnetohydrodynamic astrophysical jets in three dimensions	£97,121	1998–2001	A.Brandenburg	A.Shukurov
The Royal Society	£9,000	1998–2000	A.Brandenburg	C.F.Barengi, C.G.Campbell, A.Shukurov
The Royal Society	£416	1997	A.Shukurov	
Nuffield Foundation	£1,110	1997	A.Shukurov	
Newcastle University Small Grant	£2,500	2000	A.Shukurov	
NRAO (Socorro, USA), VLA observing time	ca 180 hours	1997–2001	R.Beck	V.Shoutenkov, A.Shukurov, D.D.Sokoloff
The Royal Society	£2058	2002–2003	A.Shukurov	
Leverhulme Trust, Nonthermal signatures of interstellar turbulence	£122,029	2004–2008	A.Shukurov	G.R.Sarson
INTAS	£11,133	2004–2007	A.Shukurov	P.M.Dolukhanov
FP6 NEST-028192 FEPRE, The formation of Europe: prehistoric population dynamics and the roots of socio-cultural diversity	€849,964	2006–2010	A.Shukurov	Seven European research groups
ATNF, Australia Telescope Compact Array, observing time C1528, “Unravelling The High-Latitude Magnetic Field of the Milky Way”	123.5 hr	2006	B.M.Gaensler	N.McClure-Griffiths, A.Mao, M.Haverkorn, P.Kronberg, A.Shukurov, G.Madsen, E.Zweibel
Royal Astronomical Society	£600	2006–2007	A.Shukurov	
The Royal Society	£3,596	2007	A.Shukurov	
Nordita, Research programme grant	£33,946	2008	A.Shukurov	K.Subramanian
STFC Short-term visitors programme ST/F003080/1	£10,549.76	2008–2011	A.Fletcher	P.J.Bushby, I.G.Moss, G.R.Sarson, A.Shukurov
NRAO (Socorro, USA), VLA observing time, AM959 “Final Frontiers of the Milky Way’s Magnetic Field”	23.1 hr	2008	S.Mao	J.-A.Brown, B.M.Gaensler, A.R.Taylor, J.Still, M.Haverkorn, N.McClure-Griffiths, A.Shukurov, P.Kronberg
Leverhulme Trust, Mathematical models for the developed Neolithic, F/00 125/AD	£137,960	2009-2012	G.R.Sarson	R.J.Boys, A.Golightly, A.Shukurov
Royal Society, International Joint Project, The origin and observational signatures of cosmic magnetic fields	£12,000	2011–2013	A.Fletcher	P.Bushby, G.R.Sarson, A.Shukurov
Leverhulme Trust, Quantitative morphology of interstellar gas in the Milky Way, RPG-097	£133,902	2011-2014	A. Fletcher	A. Shukurov

## Research Associates since 1996

- F. J. Sánchez-Salcedo, Marie Curie Fellow, EU TMR Programme 1997–1999 (supervised jointly with A. Brandenburg)
- W. Dobler, 1998–2001, , the Leverhulme Trust (supervised jointly with A. Brandenburg)
- A. Bardou, 1998–2002, *Project Title Here*, PPARC (supervised jointly with A. Brandenburg and C. G. Campbell)
- B. von Rekowski, 1998–2002, , PPARC (supervised jointly with A. Brandenburg)
- A. F. Fletcher, 2004–2007, *Nonthermal signatures of interstellar turbulence*, Leverhulme Trust’s Research Grant F/00 125/N
- F. Feugier, 2007–2008, FP6 STREP project NEST-028192 FEPRE, *The formation of Europe: prehistoric population dynamics and the roots of socio-cultural diversity* (supervised together with P. M. Dolukhanov and G. R. Sarson).
- S. L. Wilkin, 2007, *Nonthermal signatures of interstellar turbulence*, Leverhulme Trust Grant F/00 125/N (supervised jointly with A. Fletcher)
- R. A. Stepanov, 2007–2008, *Nonthermal signatures of interstellar turbulence*, Leverhulme Trust Grant F/00 125/N (supervised together with A. Fletcher)
- H. C. Sarson, 2009–2010, FP6 STREP project NEST-028192 FEPRE, *The formation of Europe: prehistoric population dynamics and the roots of socio-cultural diversity* (supervised together with P. M. Dolukhanov and G. R. Sarson).
- A. W. Baggaley, 2010–2012, D. A. Henderson, 2012–2013 Mathematical models for the developed Neolithic, Leverhulme Trust Grant F/00 125/AD (supervised jointly with R. J. Boys, A. Golightly and G. R. Sarson)
- I. N. Makarenko, 2011–2014, Quantitative morphology of interstellar gas in the Milky Way, Leverhulme Trust Research Grant RPG-097 (supervised jointly with A. F. Fletcher)

## PhD Students since 1996

- Andrew Fletcher, 1998–2001, *Magnetic Fields of Galaxies. Interpretation of Observations and Modelling*, PhD awarded in 2002
- Andrew Snodin, 2001–2008, *Magnetic Fields, Cosmic Rays and Synchrotron Emission in Spiral Galaxies*, PhD awarded in 2008
- Anthony J. Mee, 2002–2007, *Studies of Interstellar Hydromagnetic Turbulence*, PhD awarded in 2007
- S. Louise Wilkin, 2003–2007, *Magnetic Structures Produced by the Fluctuation Dynamo* (supervised jointly with C. F. Barenghi), PhD awarded in 2007
- Kate Davison, 2004–2008, *The Neolithic of Europe. Mathematical Modelling and Radiocarbon Data* (supervised jointly with G. R. Sarson), PhD awarded in 2008
- Andrew W. Baggaley, 2006–2010, *Flux Rope Dynamo* (supervised jointly with C. F. Barenghi), PhD awarded in 2010
- Andrew Smith, 2007–2011, *Galactic magnetic fields* (supervised jointly with A. Fletcher), viva in October 2011 (minor revision)

[Frederick A. Gent](#), 2008–2012, *Supernovae driven turbulence in the interstellar medium* (supervised jointly with G. R. Sarson and A. Fletcher); admitted to the degree immediately after the viva.

Kavita Gangal, since 2010, *Mathematical modelling for prehistory in Eurasia* (supervised jointly with G. R. Sarson)

## Conference Organisation from 2000

1. Physics of Accretion and Associated Outflows, Copenhagen, 5–8 January 2000, a conference organized by TAC & Nordita, member of the Scientific Organizing Committee (<http://www.tac.dk/meetings/discs2000/>).
2. The 24th IAU General Assembly, 7–18 August 2000, Joint Discussion 14, The Origin of Galactic Magnetic Fields, Manchester, 16 August 2000, Chairman of the Organising Committee.
3. Magnetic Fields in Galaxies: Observations and Models, Lorentz Center, Leiden University (The Netherlands), 5–8 July 2004, member of the Coordinating Committee.
4. Cosmic Ray Dynamics: from Turbulent to Galactic-Scale Magnetic Fields, Copenhagen, Denmark, 2–4 September 2004, Member of the Scientific Organizing Committee (<http://www.nordita.dk/conference/CosmicRay2004/>).
5. Perm Dynamo Days, International workshop, 7–11 February 2005, member of the Scientific Organizing Committee (<http://pdd2005.icmm.ru/>).
6. One of two principal investigators of the research programme and conference *Turbulence and Dynamos*, Nordita, Stockholm, Sweden, 16 March–11 April 2008 ([agenda.albanova.se/conferenceDisplay.py?confId=325](http://agenda.albanova.se/conferenceDisplay.py?confId=325)).
7. One of three members of the Organizing Committee of the international meeting *Astrophysical Magnetohydrodynamics*, 6–10 April 2009, Kiljavanranta, Finland ([agenda.albanova.se/conferenceDisplay.py?confId=884](http://agenda.albanova.se/conferenceDisplay.py?confId=884)).
8. Member of the Organising Committee of the Workshop “Magnetic Fields in the Universe”, 1–5 March 2010, International Space Science Institute (ISSI, Bern Switzerland).
9. One of three organizers of the 4th Workshop of the FEPRE Consortium, Newcastle, U.K., 15–16 April, 2010 (<http://fepre.mas.ncl.ac.uk/>).

## Invited Talks and Lectures at Advanced Schools from 1999

1. *Plasma Turbulence and Energetic Particles in Astrophysics*, Cracow, Poland, 5–10 September 1999, invited review.
2. The Interstellar Medium in M31 and M33, 232 WE-Heraeus Seminar, 22–25 May 2000, Bad-Honnef (Germany), invited review.
3. Invited lecture ‘Observational evidence of dynamo action in disc galaxies’ at the workshop in honour of Prof. K.-H. Raedler, Astrophysikalisches Institut Potsdam (Germany), 10–15 Sept. 2000.
4. Invited talk ‘Modelling the multi-phase interstellar medium’, Astronomisches Kolloquium, Max-Planck-Institut für Radioastronomie & Astronomische Institut der Universität Bonn (Bonn, Germany, 25 January 2002).
5. “Simulations of the multi-phase interstellar medium”, *3rd Meeting of the Graduiertenkolleg 787 Galaxy Groups as Laboratories for Baryonic and Dark Matter* (Bad Honnef, Germany, 17–18 June 2002), invited lecture
6. London Mathematical Society’s Durham Symposium: Astrophysical Fluid Mechanics, Durham, U.K., 29 July–8 August 2002, invited talk “Magnetic fields in barred galaxies: observations and modelling”.
7. Three lectures “Galactic magnetic fields and interstellar turbulence”, 8th Discussion Meeting on a Frontier Area of Research in Physics: *Astrophysical, Geophysical and Atmospheric Fluid Dynamics* (Varadanahalli, India, 3-7/01/2003).

8. Mathematical Aspects of Natural Dynamos, Caramulo, Portugal, 31/08-6/09/2003, invited talk: Observational evidence for the origin of galactic magnetic fields
9. A 4-lecture course “Introduction to Interstellar Turbulence” (4 hours), *International Max-Planck Research School* (Bonn, Germany, 12-13/07/2004).
10. Invited long-term participant and conference speaker, “Magnetic fields in galaxies”, research programme *Magnetohydrodynamics of Stellar Interiors*, Isaac Newton Institute of Mathematical Sciences (Cambridge, U.K., 6/09-17/12/2004).
11. Invited lecture “Galactic magnetic fields” at the London Mathematical Society’s Spitalfield Day *Magnetic Fields in Plasmas, Stars and Galaxies* (Cambridge, U.K., 6/12/2004).
12. Perm Dynamo Days, International workshop, 7–11/02/2005, Perm, Russia, invited talk (<http://pdd2005.icmm.ru/>).
13. “Depolarization canals in Milky Way radio maps”, *Sky polarization at far-infrared to radio wavelengths: the Galactic screen in front of the Cosmic Microwave Background* (Orsay, France, 12-15/09/2005).
14. Warwick Turbulence Symposium, Joint Workshop and Graduate Summer School *Instabilities and Turbulence in MHD flows*, 26 June – 1 July 2006, Warwick (UK), Invited lecture: “Introduction to galactic dynamos”. Workshop talk: “Contour statistics, depolarization canals and interstellar turbulence” ([http://www.warwick.ac.uk/~masbu/turb\\_symp/mhd.html](http://www.warwick.ac.uk/~masbu/turb_symp/mhd.html)).
15. “Fluctuation dynamos at  $P_m \ll 1$ , *Dynamo Workshop*, Paris, 22-23/01/2007, round table discussion organiser.
16. Member of the Scientific Committee and Lecturer (Astrophysical dynamos, 7 lectures, 10.5 hours), Les Houches Summer School, Session 88 Dynamos (Les Houches, France, 30/07-24/08/2007).
17. Invited talk “Multiple sources of the European Neolithic”, *Radiocarbon in Archaeological and Palaeoenvironmental Research*, Institute for the History of Material Culture, Russ. Acad. Sci. (St Petersburg, 9-12/04/2007).
18. Nordita Colloquium *Prehistoric demography and the spread of the Neolithic: mathematical models based on radiocarbon dates*, 10 April 2008, Stockholm, Sweden.
19. Invited participant and conference speaker, “Turbulence and dynamo action in galaxy clusters”, research program *Dynamo Theory*, Kavli Institute of Theoretical Physics (Univ. of California Santa Barbara, USA, 5/05-18/07/2008).
20. “The continuing story of galactic magnetic fields: what we do not know, and why”, *Ultra-High Energy Cosmic Rays and Magnetic Fields in the Universe* (Ringberg Castle, Tegernsee, Germany, 11/14/02/2009) (<http://www.schloss-ringberg.de/english/index.htm>).
21. MPIfR Colloquium, 26/02/2009, ”What we do not know about galactic magnetic fields and why”, MPIfR, Bonn
22. Co-Director and Lecturer (courses “Galaxies and the Universe”, “Galactic Dynamos”, and “Cluster Dynamos”, 7 hours), Advanced School *Astrophysical Turbulence and Dynamos*, Abdus Salam International Centre for Theoretical Physics (Trieste, Italy, 20-30/04/2009).
23. A three-lecture course “Interstellar Hydrodynamics” (3 hours total), VSP/VSRP/refresher course for university lecturers and postdocs, IUCAA (Pune, India, 9-12/06/2009).
24. “Energy release statistics and nonlinear states of a flux rope dynamo”, *Anglo-French Dynamo Conference* (Cambridge, U.K., 14-15/09/2009).



25. “Turbulent magnetic fields in the interstellar and intracluster medium and cosmic ray propagation”, *Ultra-High Energy Cosmic Ray Interactions and the Large Scale Structure of the Universe*, Bartol Institute, University of Delaware (Newark, DE, USA, 9-11/12/2009).
26. A four-lecture course “Dynamos on galactic scales” (4 hours), Nordita Winter School *Dynamos: Above, Below and in the Laboratory* (Stockholm, Sweden, 11-22/01/2010).
27. A two-lecture course “Large-scale and small-scale dynamos in interstellar and intracluster plasmas” (3.5 hours), Research Unit FOR 1048, PostGraduate School *MHD Dynamos in Laboratory and Astrophysical Plasmas*, Ruhr-Universitt (Bochum, Germany, 15-19/02/2010).
28. “What we do not know about galactic magnetic fields, and why”, *Magnetic Fields in the Universe*, International Space Science Institute (ISSI, Bern, Switzerland, 1-5/03/2010).
29. “Galactic dynamo action from small to large scales”, *Cosmic Magnetism -- from Stellar to Intergalactic Scales* (Kiama, Australia, 7-11/06/2010).
30. “Conference summary”, RädlerFest: Alpha Effect and Beyond, Stockholm, 14–18 February 2011 (<http://agenda.albanova.se/conferenceDisplay.py?confId=2480>).
31. “Interstellar Turbulence”, Summer School of the DFG Research Unit FOR 1254, *Magnetic Fields: From Star-forming Regions to Galaxy Clusters and Beyond*, 18–22 July 2011, Ringberg Castle (Teugnsee, Germany) (<http://www.mpifr-bonn.mpg.de/div/meetings/2ndRU1254/>)
32. “Galactic Dynamos Need Galactic Outflows to Survive”, *Galactic Magnetism – Perspectives of Observation and Modeling*, Pushchino (Russia), 17–20 May 2011
33. “Conference summary”, *Galactic Magnetism – Perspectives of Observation and Modeling*, Pushchino (Russia), 17–20 May 2011
34. “The Neolithic Revolution”, 12/03/2012, *Newcastle Science Fest'2012*, 8–15 March 2012, The Literary & Philosophical Society (Lit & Phil) of Newcastle upon Tyne (<http://www.newcastlesciencefest.com/programme.html>)