

# Curriculum Vitae for Oleg Kargaltsev

## Personal details

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## Education

6/1999-12/2004 Ph.D., Astronomy & Astrophysics, Penn State University, State College, PA, USA

9/1996-6/1998 M.S., Astrophysics, Moscow Institute of Physics and Technology, Russia

1992-1996 B.S., Physics, Moscow Institute of Physics and Technology, Russia

## Positions Held

4/2007-present Research Associate, Penn State University

1/2005-3/2007 Postdoctoral Research Scholar, Penn State University

6/2000-12/2004 Graduate Research Assistant, Dept. of Astronomy and  
Astrophysics, Penn State University.  
Supervisor: George G. Pavlov, Ph.D. (**Topic**: X-ray and optical observations of neutron  
stars and pulsar-wind nebulae)

9/1999-5/2000 Graduate Teaching Assistant, Dept. of Astronomy and  
Astrophysics, Penn State University

8/1998-5/1999 Graduate Research Assistant, Dept. of Physics and Cosmology,  
University of Kansas.  
Supervisors: Dave Besson, Ph.D. (**Topic**: Radio Ice Cherenkov Experiment)  
Adrian L. Mellot, Ph.D. (**Topic**: Large scale distribution of  
clusters of galaxies)

9/1996-5/1998 Research Assistant, P.N. Lebedev Physical Institute, Moscow, Russia.  
Supervisor: Yakov N. Istomin, Ph.D. (**Topic**: Modeling spectra from the bursts on the  
neutron star surface)

## Research Experience

2000-present X-ray and optical observations of neutron stars  
and pulsar-wind nebulae.  
Working in the group of Prof. George G. Pavlov, Penn State University

2000-present Member of Penn State Chandra ACIS Team led by Prof. G. Garmire.

1999-2000 Modeling GRB optical afterglow lightcurves.  
Advisor: Prof. Peter I. Mészáros, Penn State University

1998-1999 Radio Ice Cherenkov Experiment  
Advisor: Prof. Dave Besson, University of Kansas

Large scale distribution of clusters of galaxies  
Advisor: Prof. Adrian L. Melott, University of Kansas

1996-1998 Origin of gamma-ray bursts. Neutron stars atmospheres.  
Advisor: Prof. Yakov N. Istomin, P. N. Lebedev Physical  
Institute, Moscow, Russia

## **Observing proposals:**

2007, GO Chandra – Cycle 9, Principal Investigator, “Spatially-resolved spectroscopy of pulsar-wind nebulae”

2007, GTO Chandra – Cycle 9, Observer, “Snap-shot survey of potential GeV and TeV pulsars”

2007, GO XMM – Cycle 6, Principal Investigator, “Search for crushed plerions: TeV to X-ray connection”

2007, GO XMM – Cycle 6, Principal Investigator, “Studying the longest pulsar trail”

2006, GO Chandra – Cycle 8, Principal Investigator, “X-rays from the unusual relativistic binary J1906+0746”

2006, GO HST – Cycle 15, Principal Investigator, “ACS polarimetry of the Vela pulsar-wind nebula”

2006, GO Suzaku – Cycle 1, Principal Investigator, “Solving the mystery of Vela X: Connection to the Vela pulsar”

2006, GO XMM – Cycle 5, Principal Investigator, “Completing the X-ray census of Plerionic Supernova Remnants within 7 kpc”

2005, GO Chandra – Cycle 7, Principal Investigator, “Resolving pulsar-wind nebula around the energetic PSR J1617-5055”

2005, GO HST – Cycle 14, Principal Investigator, “Ultraviolet spectrum of the binary millisecond pulsar J0437-4715”

2005, GO HST – Cycle 14, Principal Investigator, “Studying the spectrum of PSR B0656+14 with ACS”

2004, GO XMM – Cycle 4, Principal Investigator, “Snap-Shot Survey of Supernova Remnants with Plerionic Components”

2004, GTO Chandra – Cycle 6, Observer, “X-rays from a Double Neutron Star Binary J1537+1155”

2004, GTO Chandra – Cycle 6, Observer, “Vela-Like PSR B1800-21 and its Environment”

2003, GTO Chandra – Cycle 5, Observer, “Center-filled SNR G16.85–1.05 and its surroundings”

2001, GO Chandra – Cycle 3, Co-Investigator, “The dynamical pulsar-wind nebula in the Vela SNR”

## **Main research interests**

Neutron stars and related phenomena (X-ray and optical observations and theory of neutron stars and pulsar-wind nebulae: NS cooling models, NS magnetospheres, shocks and winds, emission mechanisms, accreting NS/BH binaries, microquasars).

Gamma-ray bursts (X-ray observations, fireball-shock scenario, GRB-supernova connection, optical and X-ray afterglows).

## **Other research interests**

Astrophysics of Compact Objects, Hydrodynamics and MHD (shocks, instabilities, jets). Observational signatures of black holes.

Galactic sources of TeV emission.

CMBR Anisotropy and Large-Scale Structure of the Universe.

## **Societies, awards and grants**

2003-2004	Graduate Alumni Association Dissertation Award
2001-2002	Zaccheus Daniel Foundation for Astronomical Science, Travel Grant
2001-present	American Astronomical Society, Full Member
1998-2001	Braddock Fellowship (for excellence in studying)
1998-present	American Physical Society, Full Member
1996,1998	I. E. Tamm Theoretical Department fellowship at P. N. Lebedev Physical Institute
1997-1998	Russian Foundation for Fundamental Research, grant #96-02-18203

## **Astronomical data analysis experience**

Chandra ACIS and HRC imaging, spectroscopy and timing data analysis

XMM EPIC imaging spectroscopy, timing

Astrometry, photometry and polarimetry with HST WFPC, ACS, STIS and NICMOS.

HST STIS spectroscopic and timing data analysis

## **Computer skills**

Astronomical data analysis with FTOOLS, IRAF, STSDAS, CIAO, XSPEC, XMM SAS

Programming in C/C++, IDL, Java, TCL, HTML, Matlab, Mathematica, Perl, Shell script, CL

Knowledge of Unix (Solaris, Linux), Windows OSs.

## Selected Publications in Refereed Journals

1. Pavlov G. G., Kargaltsev O., & Brisken W. F. “Chandra Observation of PSR B1823-13 and its Pulsar Wind Nebula”, 2007, ApJ, submitted
2. Kargaltsev, O., Pavlov, G. G., & Garmire, G. P., “HESS J1804-216 in X-rays and at other wavelengths”, 2007, ApJ, accepted, (astro-ph/0701069)
3. Kargaltsev, O., & Pavlov G. G., “X-ray emission from PSR J1809–1917 and its pulsar wind nebula, possibly associated with the TeV gamma-ray source HESS J1809–193”, 2007, ApJ, accepted, (arXiv:0705.2378)
4. Pavlov, G., Kargaltsev, O., Garmire, G., & Wolszczan, A., “X-ray emission from the planet pulsar B1257+12”, 2007, ApJ, accepted, (arXiv:0704.2079)
5. Kargaltsev, O., Pavlov, G. G., & Garmire, G. P., “X-ray emission from PSR B1800-21 and its pulsar-wind nebula”, 2007, ApJ, 660, 1417
6. Kargaltsev, O., & Pavlov, G., “UV emission from young and middle-aged pulsars”, 2007, Astrophysics and Space Science, 308, 287
7. Sangwook, P., Mori, K., Kargaltsev, O., et al., “Discovery of a Candidate Central Compact Object in the Galactic Nonthermal SNR G330.2+1.0”, 2006, ApJ, 653L, 37
8. Kargaltsev, O., Pavlov, G. G., & Garmire, G. P., “X-ray Emission from the Double Neutron Star Binary J1537+1155”, 2006, ApJ, 646, 1139
9. Kargaltsev, O., Pavlov, G. G., & Garmire, G. P., “X-ray Emission from the Nearby PSR B1133+16 and Other Old Pulsars”, 2006, ApJ, 636, 406
10. Romani, R. W., Kargaltsev, O., & Pavlov, G. G., “The Vela pulsar in UV”, 2005, ApJ, 627, 383
11. Kargaltsev, O., Pavlov, G. G., Romani R. W., & Zavlin, V. E., “Ultraviolet Emission from the Geminga Pulsar: Connecting X-rays with the Optical”, 2005, ApJ, 625, 307
12. Mignani, R. P., Pulone L., Iannicola, G., Pavlov, G. G., Townsley, L., & Kargaltsev, O., "Search for the elusive optical counterpart of PSR J0537-6910 with the HST Advanced Camera for Surveys", 2005, A&A, 431, 569
13. Kargaltsev, O., Pavlov, G. G., & Romani, R. W., “Ultraviolet Emission from the Millisecond Pulsar J0437-4715”, 2004, ApJ, 602, 327
14. Mignani, R. P., De Luca, A., Kargaltsev, O., Pavlov G. G., Zaggia S., Caraveo P. A., & Becker W., “Search for the Optical Counterpart of the Vela Pulsar X-ray Nebula”, 2003, ApJ, 594, 419
15. Pavlov, G. G., Teter, M. A., Kargaltsev, O., & Sanwal, D., “The Variable Jet of the Vela Pulsar”, 2003, ApJ, 591, 1157
16. Kargaltsev, O., Pavlov, G. G., Sanwal, D., & Garmire, G. P., “The Compact Central Source of the SNR G266.2-1.2”, 2002, ApJ, 580, 1060
17. Pavlov, G. G., Kargaltsev, O., Sanwal D., & Garmire, G. P., “Variability of the Vela Pulsar Wind Nebula Observed with Chandra”, 2001, ApJ, 554, L189

## Conference proceedings

1. Kargaltsev, O., & Pavlov, G. G., “Vela PWN: A new perspective”, 2004, in "Young Neutron Stars and Their Environments" (IAU Symposium 218, ASP Conference Proceedings), eds F. Camilo and B. M. Gaensler, p. 195, (astro-ph/0310767)
2. Kargaltsev, O., Pavlov, G. G., Teter, M. A., Sanwal, D., “The jets of the Vela pulsar”, 2003, *New Astronomy Reviews*, 47, 487, in the Proc. of “The Physics of Relativistic Jets in the CHANDRA and XMM Era” symposium, 23-27 September 2002, Bologna, Italy.
3. Sanwal, D., Pavlov, G. G., Kargaltsev, O., Garmire, G. P., Zavlin, V. E., Burwitz, V., Manchester, R. N. & Dodson, R., “X-ray Spectrum and Pulsations of the Vela Pulsar”, in *Neutron Stars in Supernova Remnants*, ASP ser., v. 271, p. 353, 2002, eds. P.O. Slane & B. M. Gaensler.
4. Kargaltsev, O., Pavlov, G. G., Sanwal, D., & Garmire, G. P., “The Vela pulsar wind nebula resolved with Chandra”, in *Neutron Stars in Supernova Remnants*, ASP ser., v. 271, p. 181, 2002, eds. P.O. Slane & B. M. Gaensler.

## Conference abstracts

1. Kargaltsev, O., Pavlov, G., Sanwal, D., et al. “X-ray Emission From Vela-like Pulsar B1800-21 And Other Young Pulsars Observed With Chandra” 2006, AAS HEAD meeting 9, #7.57
2. Kargaltsev, O., Pavlov, G. G., Garmire, G. P., & Sanwal, D. “Chandra Observations of Radio Pulsars”, 2005, in *Six Years of Science with Chandra: Dedicated to Leon Van Speybroeck*
3. Kargaltsev, O., & Pavlov, G. G., “X-ray Properties of Pulsars and their Wind Nebulae”, 2004, AAS Meeting 205, #102.14
4. Pavlov, G. G., Kargaltsev, O., Romani, R., & Zavlin, V. , “Far-UV radiation from pulsars: Connecting X-rays with optical”, 2004, American Astronomical Society, HEAD meeting #8, #11.02
5. Pavlov, G. G., Kargaltsev, O., Zavlin, V. E., & Sanwal, D, “Pulsars and Pulsar-wind Nebulae in the Chandra Era”, 2003, in *Four Years of Chandra Observations: A Tribute to Riccardo Giacconi*
6. Teter, M. A., Pavlov, G. G., Sanwal, D. & Kargaltsev, O. , “The Twisting Jet from the Vela Pulsar”, 2002, 200th AAS Meeting, #78.06; BAAS, Vol. 34, p.779
7. Kargaltsev, O., Pavlov, G. G., Sanwal, D., Garmire, G. P., “The Compact Central Source of the SNR G266.2-1.2”, 2002, 200th AAS Meeting, #72.02; BAAS, Vol. 34, p.764
8. Pavlov, G. G., Sanwal, D., Kargaltsev, O., & Garmire, G. P. , “The Vela Pulsar and its Synchrotron Nebula: Surprises from Chandra” , 2001, in *Two Years of Science with Chandra Symposium in Washington*.

## Press releases

“Firehose-like jet discovered in action”, NASA News Release, 06/30/2003