

THE UNIVERSITY OF BRITISH COLUMBIA*Curriculum Vitae for Faculty Members***Date :** March 27, 2012**Please initial:**

1. **SURNAME:** Heyl **FIRST NAME:** Jeremy
MIDDLE NAME(s): Samuel
2. **DEPARTMENT:** Physics and Astronomy
3. **FACULTY:** Science
4. **PRESENT RANK:** Associate Professor **SINCE:** 1 July 2008
5. **POST-SECONDARY EDUCATION**

University or Institution	Degree	Subject Area	Dates
Princeton University	A.B.	Astrophysics	1988/9 - 1992/6
Durham University		Physics	1992/9 - 1993/9
Cambridge University	M.Sc.	Astronomy	1993/9 - 1994/9
University of California – Santa Cruz	Ph.D.	Astrophysics	1994/9 - 1997/12

*Special Professional Qualifications***6. EMPLOYMENT RECORD****(a) Prior to coming to UBC**

University, Company, or Organization	Rank or Title	Dates
Princeton University Observatory	Research Assistant	1989/6 - 1989/9
IBM Corporation	Consultant	1990/6 - 1990/9
National Astronomical and Ionospheric Center	Research Assistant	1991/6 - 1991/8
The Central Astronomical Observatory at Pulkovo	Visiting Researcher	1992/6 - 1992/9
California Institute of Technology	Lee A. DuBridge Postdoctoral Fellow in Theoretical Astrophysics	1998/1 - 2000/8
Harvard-Smithsonian Center for Astrophysics	Chandra Fellow	2000/9 - 2003/7

(b) at UBC

Rank or Title	Dates
Assistant Professor, Tier II Canada Research Chair	2003/8 - 2008/6
Associate Professor, Tier II Canada Research Chair	2008/7 - present

(c) Date of granting of tenure at U.B.C. : 1 July 2008

7. LEAVES OF ABSENCE

University, Company or Organization at which Leave was taken	Type of Leave	paid/unpaid	Dates

8. TEACHING**(a) Areas of special interest and accomplishments**

I have taught students of various ages from preschool, elementary and high school students both in person and through teleconferences (through the Columbus Museum of Science and Industry, COSI), undergraduate students, graduate students and retirees. I have found that the most effective way to teach is to kindle the learners' interest by hooking the new knowledge into something that they already know. The next step is to extend this knowledge in hopefully a surprising way. It is great when the learners themselves can make or anticipate a few of the steps especially the last one. The emotional response of surprise or the effort in making the logical progression helps solidify the knowledge.

Similarly I have found that more work that the learners do, the more effectively that they learn the new concepts. This comes under the category of "Everything I needed to know about learning I learned in kindergarten". Learning in elementary schools involves relatively little listening and lots of doing. In university there is of course a different balance between these activities but the "doing" is no less important — in larger classes this takes the form of questions for the students to answer to each other during the lectures, and in the smaller groups I have used tutorial sessions with myself and my teaching assistants giving one-on-one guidance to solve the tutorial problems — I have found these techniques effective both in elementary (where they are more customary) and more advanced courses (which even today often take the form of a traditional lecture); it limits the students' frustration and reinforces the important concepts, and as a bonus it is a lot more fun for both the students and the instructor!

Starting in the fall of 2009 I have redeveloped ASTR 303 and ASTR 311 to follow a more interactive model. The small class size of the former allow a real seminar-style class with ongoing assessment of the student's participation. I kept the students up-to-date with weekly homework and in-class assessment. Participation, retention and student satisfaction increases dramatically over the previous year. The second course (ASTR 311) was much larger, so a seminar approach was not feasible. Here I used peer instruction, clicker questions and on-going assessment to increase student involvement. Again the students met the learning goals and expressed satisfaction with the course. This past fall I taught an upper-level/graduate course in astrophysics (that I have taught in the past, so I have a point of comparison) and increased student engagement and retention, building on the successes of the earlier courses.

(b) Courses taught at UBC [*for last 5 years*]

Session	Course Number	Scheduled lecture hours per week	Class Size	Hours Taught			
				Lectures	Tutorials	Labs	Other (Office hours)
win 2005	ASTR 402	3	17	36	0	0	24
win 2005	PHYS 350	3	54	36	12	0	24
win 2006	ASTR 402	3	11	36	0	0	24
win 2006	PHYS 350	3	61	36	12	0	24
win 2007	PHYS 350	3	57	36	12	0	24
win 2008	ASTR 303	3	15	36	0	0	24
win 2009	ASTR 303	3	15	36	0	0	24
win 2009	ASTR 304	3	14	12	0	0	8
win 2010	ASTR 311	3	51	36	18	0	36
win 2011	ASTR 402	3	12	36	0	0	24
win 2011	ASTR 311	3	105	36	18	0	36

(c) Graduate Students Supervised

Student Name	Program Type	Year		Principal Supervisor	Co-Supervisor(s)
		Start	Finish		
Yoram Lithwick	Ph.D.	1998	1999	Peter Goldreich	Jeremy Heyl
Don Lloyd	Ph.D.	1998	2003	Lars Hernquist	Jeremy Heyl
Dastegir Al-Quaderi	M.Sc.	2003	2007	Jeremy Heyl	
Jonathan Benjamin	M.Sc.	2004	2005	Jeremy Heyl	
Anand Thirumalai	M.Sc.	2005	2007	Jeremy Heyl	
Anand Thirumalai	Ph.D.	2007	–	Jeremy Heyl	
Alain Prat	Ph.D.	2006	–	Jeremy Heyl	
Kelsey Hoffman	Ph.D.	2006	–	Jeremy Heyl	
Dan Mazur	Ph.D.	2006	–	Jeremy Heyl	
Ramandeep Gill	Ph.D.	2007	–	Jeremy Heyl	
Samara Pillay	M.Sc.	2011	–	Jeremy Heyl	Jaymie Matthews

(d) Undergraduate Students Supervised

Student Name	Year		Principal Supervisor	Co-Supervisor(s)
	Start	Finish		
Ryan Shannon	2003	2004	Jeremy Heyl	
Derek MacKay	2003	2004	Jeremy Heyl	
Flora Ge	2004	2005	Jeremy Heyl	
Mark McAnerin	2006	2007	Jeremy Heyl	
Ramandeep Gill	2006	2007	Jeremy Heyl	
Hong Tsui	2007	2008	Harvey Richer	Jeremy Heyl
Ronald Gagne	2008	2009	Harvey Richer	Jeremy Heyl
Matthew Penrice	2008	2009	Jeremy Heyl	
Magnus Haw	2010	2010	Jeremy Heyl	
Chenruo (John) Qi	2010	2010	Jeremy Heyl	
Chenruo (John) Qi	2011	–	Jeremy Heyl	

(e) Continuing Education Activities

Educational consultant to Nickelodeon Television Network, 2001,

Speaker for Amateur Telescope Makers, Boston Chapter, 2001.

Portable Planetarium Presentation at Community Nursery School, Lexington MA, 2003.

Speaker at RASC, Vancouver Chapter, 2003.

Electronic Expert for COSI (Columbus Ohio Science Musuem), 2004-2007, 2011.

Speaker at the Summerhill, North Vancouver, 2004.

Speaker at the Ideal Mini School, Vancouver, 2005.

Speaker at MISC, 2008.

Demonstations at Immaculate Conception School, Vancouver, 2008-

Demonstations at St. Patrick Regional Secondary, Vancouver, 2012-

Speaker at New Bright Lights, 2010.

(f) Visiting Lecturer (indicate university/organization and dates)

(g) Other

Instructional Skills Workshop, Teaching and Academic Growth, UBC, April 2007.

Multiple-Choice Question Writing Workshop, Teaching and Academic Growth, UBC, May 2010.

9. SCHOLARLY AND PROFESSIONAL ACTIVITIES

(a) Areas of special interest and accomplishments

Theory and phenomenology of neutron stars, black hole and gamma-ray bursts; strong-field QED, high-density QCD, properties of matter in strong magnetic fields

(b) Research or equivalent grants [for last 10 years]

(indicate under COMP whether grants were obtained competitively (C) or non-competitively (NC))

Granting Agency	Subject	COMP	\$ per year	Years	Principal Investigator	Co-Investigator(s)
NASA Chandra Fellow	Probing Neutron-Star Physics	C	100,000	2000-2003	J. Heyl	
CFI CRC	Parallel Computer for Compact-Object Physics	C	120,000	2003	J. Heyl	
BCKDF CRC	Parallel Computer for Compact-Object Physics	C	120,000	2003	J. Heyl	
NSERC Discovery	Nuclear Processes on Neutron Stars	C	33,000	2004-2007	J. Heyl	
NSERC Discovery	Neutron-Star Physics	C	37,000	2007-2012	J. Heyl	

(c) Research or equivalent contracts [for last 10 years]

(indicate under COMP whether contracts were obtained competitively (C) or non-competitively (NC))

Granting Agency	Subject	COMP	\$ per year	Years	Principal Investigator	Co-Investigator(s)

(d) Invited Presentations

Invited Symposia Lectures

1. Heyl, J. S., Shaviv, N. J., Lithwick, Y. 1999, “The Optics of Neutron-Star Magnetospheres,” *AAS/High Energy Astrophysics Division Meeting #31*, 10.01.
2. Heyl, J. 2000, “Neutron Star Cooling for High B Fields,” *Spin, Magnetism and Cooling of Young Neutron Stars at ITP*, .
3. Heyl, J. 2002, “The QED-GRB Connection (some things you should remember if the field is strong),” *2002 Sackler Meeting at Harvard*, .
4. Heyl, J. 2003, “What can Neutron Stars Tell Us about QED and Vice Versa?,” *2003 CIAR meeting at Mount Tremblant*, .
5. Heyl, J. 2003, “Do Old Neutron Stars Shiver to Keep Warm?,” *2003 AstroGrav meeting at the University of Maryland*, ed. J. Centrella, .
6. Heyl, J. 2004, “Magnetars,” *The XXII Texas Symposium on Relativistic Astrophysics*, ed. P. Chen and G. Madejski, (12 pages).
7. Heyl, J. 2005, “Magnetars,” *XI Canadian Conference on General Relativity and Relativistic Astrophysics*, ed. Kristin Schleich and Don Witt, .
8. Heyl, J. 2008, “Magnetars,” *American Physical Society – Northwest Meeting*, A1002+.
9. Heyl, J. 2008, “High-field Neutron Stars - Theoretical Overview,” *The XXIV Texas Symposium on Relativistic Astrophysics*, ed. L. van Waerbeke, .

Invited Lectures

- “The Optics of Neutron-Star Magnetospheres”
 - 1999 February: Princeton Astrophysics Seminar, Columbia Astronomy Seminar,
 - 2000 January: Astronomy Seminars at MIT and Berkeley
 - 2000 April: University of Michigan High-Energy-Physics Seminar
 - 2004 February: Simon Fraser University, UBC
- “Shedding New Light on Neutron-Stars”
 - 1999 October: Canadian Institute for Theoretical Astrophysics Seminar, ITP Astrophysics Seminar,
 - 2000 January: Caltech Astronomy Colloquium,
- “What Does Cholesterol Have to Do with Neutron-Star Magnetospheres?”
 - 2000 January: Penn State Astronomy Colloquium
 - 2000 February: UCSB Astronomy Seminar
- “Probing the Properties of Neutron-Stars”
 - 2000 October: University of Washington Astronomy Colloquium

- “What can QED Tell Us about Compact Objects and Vice Versa?”
2001 February: University of Michigan Astronomy Seminar
- “El Niño, the Jet Stream and Type-I X-ray Bursts”
2002 January: Astronomy Seminars at Harvard and University of Michigan
2002 February: Princeton Astronomy Seminar
2002 March: Seminar at Cambridge
- “The Nuclear EOS and QED in Astrophysics”
2002 February: Yale Astronomy Colloquium,
- “Do Old Neutron Stars Shiver to Keep Warm?”
2002 November: SCIPP Seminar
- “The Secret Life of Neutron Stars”
2002 November: Colloquiums at UCSC Physics, Wesleyan Astronomy and University of Maryland Astronomy
2003 January: Seminar at MIT, Colloquiums at Chicago and McGill
2003 February: Astronomy Colloquium at UBC
2004 April: Astronomy Colloquium at Berkeley
2004 October: Seminar at HIA
2005 March: Colloquium at UVic
2005 November: Colloquium at TRIUMF
- “Magnetars”
2005 March: Seminar at TRIUMF
2005 July: Seminar at Durham
2006 July: Seminar at Glasgow
- “Diffractive Microlensing”
2010 March: Colloquium at CITA
- “Pseudospectral Methods for Atomic Physics”
2010 April: Workshop at KITP
- “Production of Positrons from Pulsars and Magnetars”
2010 December: Nuclear Astrophysics Workshop at TRIUMF

(e) Other Presentations

- “A Field Guide to the High-Energy Universe”
2003 October: RASC, Vancouver Chapter
2004 February, 2004 April, 2005 February: COSI electronic expert teleconference with U.S. secondary schools
- “Shaking and Baking Neutron Stars”
2008 October: MISC meeting
- “Gravitational Waves – Prospects”
2011 October: Green College Lecture

(f) Other (list PDFs, RAs, Visitors - including dates)

Postdoctoral Fellows

Research Associates

Maxim Lyutikov (September 2004-August 2006); now an assistant professor at Purdue University

Visitors

Prof. Dong Lai (Cornell), May 2006.

Dr. Kaya Mori (CITA), May 2006.

Prof. Edward Brown (MSU), August 2006.

Prof. Charles Horowitz (Indiana), August 2006.

Prof. Vladimir Usov (Weizmann), August 2007.

(g) Conference Participation (Organizer, Keynote Speaker, etc.)

Chair, Scientific Organizing Committee, “Neutron Stars at the Crossroads of Fundamental Physics”, 2005 August, a workshop sponsored by PITP, CSA, CITA, CIAR and TRIUMF.

Scientific Organizing Committee, “40 Years of Pulsars”, 2007 August

Local Organizing Committee, “Texas Meeting on Relativistic Astrophysics”, 2008 Decemeber.

10. SERVICE TO THE UNIVERSITY

(a) Memberships on committees, including offices held and dates

Departmental

Graduate Student Supervisory Committee for Anna Sajina, 2003–2005

Graduate Student Supervisory Committee for Robert Ferdman, 2003–2007

Observational Cosmology Position Search Committee, 2003–2004

Committee on Initial Appointments, 2003–2007

Graduate Student Supervisory Committee for Gaelen Marsden, 2004–2007

Graduate Student Supervisory Committee for Wan-Yan Wong, 2004–2007

Graduate Student Supervisory Committee for Bruno Mundim, 2004–2010

Chair, Retreat Planning Committee, 2005
 Graduate Student Supervisory Committee for Andrew Jason Penner, 2005–2011
 Graduate Student Supervisory Committee for Saul Davis, 2005–2008
 Graduate Student Supervisory Committee for Thomas Waterhouse, 2006–2008
 Graduate Student Supervisory Committee for Benjamin Guterrez, 2006–
 Committee on the Hiring Plan, 2007–2007
 Graduate Student Supervisory Committee for Laura Kasian, 2007–2012
 Graduate Student Supervisory Committee for Mya Warren, 2007–2010
 Editor of Departmental Newsletter, 2007–2010
 Graduate Student Supervisory Committee for Rob Stead, 2008–
 Committee on Teaching Relief, 2009
 Graduate Student Supervisory Committee for James Charbonneau, 2009–2011
 Graduate Student Supervisory Committee for Stephen Ettenauer, 2009–
 Committee on Promotion, Reappointment and Tenure, 2010–
 Graduate Student Supervisory Committee for Samantha Lawler, 2010–
 Graduate Student Supervisory Committee for Silvestre Aguilar-Martinez, 2010–
 Graduate Student Supervisory Committee for Riccardo Comin, 2011–
 Graduate Student Supervisory Committee for Kyle Lawson, 2011–
 Graduate Student Supervisory Committee for Michael Sitwell, 2011–
 Graduate Student Supervisory Committee for Michael Alexandersen, 2012–
 Graduate Student Supervisory Committee for Sarah Greenstreet, 2012–

University

Management Committee, Pacific Institute of Theoretical Physics, Program Coordinator for
 Theoretical Astrophysics, 2006–8
 Faculty Affairs Committee, Faculty of Science, 2008–
 University Examiner for Muhammed Asfak Hossain, 2009.
 University Examiner for Maxime Brodeur, 2010.
 Chair, Final Doctoral Examination for David Dietrich, 2010.
 University Examiner for Chris Cameron, 2010.
 University Examiner for Thomas Pfrommer, 2010.
 Co-organizer, Space Exploration Lecture Series at Green College, 2010–
 Chair, Final Doctoral Examination for Joshua van Loon, 2011.

(b) Other service, including dates

11. SERVICE TO THE COMMUNITY

(a) Memberships on scholarly societies, including offices held and dates

High-Energy Astrophysics Division, American Astronomical Society, 1998-present

Canadian Astronomical Society, 2004-present

CITA Inc., 2004-present

(b) Memberships on other societies, including offices held and dates

(c) Memberships on scholarly committees, including offices held and dates

(d) Memberships on other committees, including offices held and dates

Member of Science Team: X-ray Polarimetry Explorer, Generation-X, NuSTAR

Member of the board of directors, H. R. MacMillan Space Centre, Vancouver, British Columbia, 2004–2007

Member of Disciplinary Working Group on High-Energy Astrophysics, Canadian Space Agency, 2007–2009

(e) Editorships (list journal and dates)

(f) Reviewer (journal, agency, etc. including dates)

- Journal Referee (typically 2–4 papers each month):

Astrophys. J., 1994–

Phys. Rev. D, 1998–

Phys. Rev. Lett., 2000–

Mon. Not. Royal Astr. Soc., 2000–

Astron. Astrophys., 2000–

Journ. Phys. A, 2002–

Classical and Quantum Gravity, 2003–

- Proposal Referee (typically 20 proposals each year):

Chandra Guest Observer Program, 2001, 2006, 2007.

NASA Advanced Theory Program, 2002, 2003.

Gemini Guest Observer Program (1 proposal annually), 2003, 2005, 2008, 2010, 2011

Netherlands Organisation for Scientific Research: VIDI grants (1 proposal), 2003

NSERC Discovery Grant (1 proposal annually), 2004–

Etablissement de Nouveaux Chercheurs Program (1 proposal), 2004

Einstein Fellowship Program, 2009
 Canadian Space Agency (5 proposals), 2009
 National Science Foundation, 2010.
 Canada Research Chairs (2 proposals), 2010

(g) External examiner (indicate universities and dates)

University of California at Santa Cruz, 1998

(h) Consultant (indicate organization and dates)

Educational consultant to Nickelodeon Television Network, 2001,
 Consultant to the NAS/NRC Committee on the Physics of the Universe, 2001,
 Consultant to the NASA SEU Roadmap Committee, 2002.
 Adjudicator, I-Star Awards, Aga Khan Education Board for Canada, 2008–2010.

(i) Other service to the community

12. AWARDS AND DISTINCTIONS

(a) Awards for Teaching (indicate name of award, awarding organizations, date)

(b) Awards for Scholarship (indicate name of award, awarding organizations, date)

American Chemical Society Olympiad Finalist, 1988.
 Thomas J. Watson Scholar, IBM, 1988–1992.
 Princeton Department of Physics Manfred Pyka Prize, 1989.
 Barry Goldwater Scholar, 1990–1992.
 Marshall Scholar, Marshall Aid Commemoration Commission, 1992–1994.
 National Science Foundation Fellow, 1994–1997.
 Phi Beta Kappa, Northern California Association Scholar, 1995.
 Achievement Reward for College Scientists, ARCS, 1996.
 Chandra Postdoctoral Fellow, NASA, 2000–2003.
 Canada Research Chair, 2003–.

(c) Awards for Service (indicate name of award, awarding organizations, date)

(d) Other Awards

13. OTHER RELEVANT INFORMATION

(such as current personnel, major equipment, etc.) [*Max. 1 Page*]

Since arriving at UBC I have set up a theoretical high-energy astrophysics group. Over the past few years, the group has consisted of myself, one research associate (Maxim Lyutikov, Caltech Ph.D. 1998, now faculty at Purdue University), three M.Sc. graduate students (Golam Dastagir Al-Quaderi and Anand Thirumalai are both near completion, and Dan Mazur who is just starting), two Ph.D. students (Kelsey Hoffman and Alain Prat) and several undergraduate students Ramandeep Gill, Mark McAnerin, Flora Ge, Martha Milkeraitis, Derek MacKay and Ryan Shannon. The first four are now in graduate school at UBC (Ramandeep is my doctoral student) and the final two are in graduate school at Stanford and Cornell respectively.

In January 2005, I completed a thirty-four (34) node, dual Opteron Beowulf cluster located in Klinck (at approximate cost of \$200,000 from CFI and BCKDF). The group is currently using this system for numerical calculations of atomic physics in strong magnetic fields, the quantum mechanics of the inflaton field, large-scale structure formation and radiative transfer and nuclear processes on and near neutron stars. Members of the gravitational lensing and condensed matter theory groups also use the cluster regularly. Recent publications of the group may be found on the group website <http://tabitha.phas.ubc.ca>. As of April 2007, the cluster has been expanded to 42 nodes, and in September 2007 several nodes were updated with dual core processors. In March 2011, all but six nodes were updated with dual core processors and an additional NVIDIA-CUDA machine was added to the cluster. The current cluster is more than twice as powerful that the original one with only a modest additional investment.

Note on Multiple Author Papers

In astrophysics it is customary for the first author on a paper to have done the bulk (50-90%) of the work toward the paper — this is the case in the bibliography that follows. I have completed several papers with students under my supervision, specifically those with Gill, Hoffman, Mazur, Shannon and Thirumalai. I completed about 30-40% of the work in the my papers with Rosalba Perna, Kaya Mori and Dong Lai (25, 31, 32, 53 and 55). Papers where I am a third or subsequent author my contribution has been more modest (10-20%) with the exception of paper 7 (Ellis et al.) which was part of my Master's thesis where my contribution was larger as reflected by the follow-on paper (13, Heyl et al.). David Spergel supervised my undergraduate thesis which resulted in papers 1-3 and 5-6. Lars Hernquist supervised my Ph.D. thesis which included papers 8-12, 14-16, 18-20 and 30.

THE UNIVERSITY OF BRITISH COLUMBIA
Publications Record

Date : March 27, 2012

Initials: 

SURNAME: Heyl

FIRST NAME: Jeremy

MIDDLE NAME(s): Samuel

Publication Summary :

	1(a)	1(b)	1(c)	2(a,b,c)	3	4	5
Career Total	80	0	0	23	2	0	0
Last 5 Years Total	27	0	0	9	2	0	0

1 = Refereed Publications [*]: (a) Journals; (b) Conference Proceedings; (c) Other

2 = Non-Refereed Publications : (a) Journals; (b) Conference Proceedings; (c) Other

3 = Books

4 = Patents

5 = Special Copyrights

[*]=include pagination and indicate with an **asterisk** about 5 papers you consider of primary importance.

Enumerated references begin on following page.

1. REFEREED PUBLICATIONS

(a) Journals

1. Hernquist, L., Heyl, J. S., Spergel, D. N. 1993, "Bending Instabilities in Galaxy Merger Remnants," *Astrophys. J. Lett.*, **416**, 9-12.
2. Hernquist, L., Spergel, D. N., Heyl, J. S. 1993, "Structure of Merger Remnants. III. Phase-Space Constraints," *Astrophys. J.*, **416**, 415-424.
3. Heyl, J. S., Hernquist, L., Spergel, D. N. 1994, "Structure of Merger Remnants: IV. Isophotal Shapes," *Astrophys. J.*, **427**, 165-173.
4. Heyl, J. S., Cole, S., Frenk, C. S., Navarro, J. F. 1995, "Galaxy Formation in a Variety of Hierarchical Models," *Mon. Not. Royal Astr. Soc.*, **427**, 755-768.*
5. Heyl, J. S., Hernquist, L., Spergel, D. N. 1995, "Inferring Galaxy Viewing Angles," *Astrophys. J.*, **448**, 64-69.
6. Heyl, J. S., Hernquist, L., Spergel, D. N. 1996, "Structure of Merger Remnants: V. Kinematics," *Astrophys. J.*, **463**, 69-79.
7. Ellis, R. S., Colless, M., Broadhurst, T. J., Heyl, J. S., Glazebrook, K. 1996, "Autofib Redshift Survey - I. Evolution of the Galaxy Luminosity Function," *Mon. Not. Royal Astr. Soc.*, **280**, 235-251.
8. Heyl, J. S., Hernquist, L. 1996, "Magnetically Catalyzed Fusion," *Phys. Rev. C*, **54**, 2751-2759.
9. Heyl, J. S., Hernquist, L. 1997, "Powering Anomalous X-ray Pulsars by Neutron Star Cooling," *Astrophys. J. Lett.*, **489**, 67-70.
10. Heyl, J. S., Hernquist, L. 1997, "The Thermal Evolution of Ultramagnetized Neutron Stars," *Astrophys. J. Lett.*, **491**, 95-98.
11. Heyl, J. S., Hernquist, L. 1997, "QED One-Loop Corrections to a Macroscopic Magnetic Dipole," *Journ. Phys. A*, **30**, 6475-6483.
12. Heyl, J. S., Hernquist, L. 1997, "The Birefringence and Dichroism of the QED Vacuum," *Journ. Phys. A*, **30**, 6485-6492.
13. Heyl, J., Colless, M., Ellis, R. S., Broadhurst, T. 1997, "Autofib Redshift Survey: II - The Evolution of the Galaxy Luminosity Function by Spectral Type," *Mon. Not. Royal Astr. Soc.*, **285**, 613-634.*
14. Heyl, J. S., Hernquist, L. 1997, "An Analytic Form for the Effective Lagrangian of QED and its Application to Pair Production and Photon Splitting," *Phys. Rev. D*, **55**, 2449-2454.

15. Heyl, J. S., Hernquist, L. 1998, "What is the nature RX J0720.4-3125?," *Mon. Not. Royal Astr. Soc.*, **297**, L69-L70.
16. Heyl, J. S., Hernquist, L. 1998, "RCW 103 - Revisiting a cooling neutron star," *Mon. Not. Royal Astr. Soc.*, **298**, L17-L20.
17. Heyl, J. S., Kulkarni, S. R. 1998, "How common are magnetars? The implications of magnetic-field decay," *Astrophys. J. Lett.*, **506**, 61-64.*
18. Heyl, J. S., Hernquist, L. 1998, "Almost Analytic Models of Ultramagnetized Neutron Star Envelopes," *Mon. Not. Royal Astr. Soc.*, **300**, 599-615.
19. Heyl, J. S., Hernquist, L. 1998, "Hydrogen and Helium Atoms and Molecules in an Intense Magnetic Field," *Phys. Rev. A*, **58**, 3567-3577.
20. Heyl, J. S., Hernquist, L. 1998, "Electromagnetic Shocks in Strong Magnetic Fields," *Phys. Rev. D*, **58**, 043005 (10 pages).
21. Heyl, J. S., Hernquist, L. 1999, "Do magnetars glitch? : Timing irregularities in anomalous X-ray pulsars," *Mon. Not. Royal Astr. Soc.*, **304**, L37-L40.
22. Shaviv, N. J., Heyl, J. S., Lithwick, Y. 1999, "Magnetic Lensing near Ultramagnetized Neutron Stars," *Mon. Not. Royal Astr. Soc.*, **306**, 333-347.
23. Heyl, J. S., Hernquist, L. 1999, "Nonlinear QED Effects in Strong-Field Magnetohydrodynamics," *Phys. Rev. D*, **59**, 045005 (5 pages).
24. Heyl, J. S., Shaviv, N. J. 2000, "Polarization Evolution in Strong Magnetic Fields," *Mon. Not. Royal Astr. Soc.*, **311**, 555-564.
25. Perna, R., Heyl, J., Hernquist, L. 2000, "Consequences of Interstellar Absorption for Models of Anomalous X-Ray Pulsars," *Astrophys. J. Lett.*, **538**, 159-161.
26. Heyl, J. S. 2000, "Gravitational Radiation from Strongly Magnetized White Dwarfs," *Mon. Not. Royal Astr. Soc.*, **317**, 310-314.
27. Heyl, J. S. 2000, "Probing the Properties of Neutron Stars with Type I X-ray Bursts," *Astrophys. J. Lett.*, **542**, 45-48.
28. Chakrabarty, D., Pivovarov, M. J., Hernquist, L. E., Heyl, J. S., Narayan, R. 2001, "The Central X-Ray Point Source in Cassiopeia A," *Astrophys. J.*, **548**, 800-810.
29. Heyl, J. S. 2001, "Electron-Positron Jets from a Critically Magnetized Black Hole," *Phys. Rev. D*, **63**, 064028 (7 pages).
30. Heyl, J. S., Hernquist, L. 2001, "Multidimensional thermal structure of magnetized neutron star envelopes," *Mon. Not. Royal Astr. Soc.*, **324**, 292-304.
31. Perna, R., Heyl, J., Hernquist, L. 2001, "X-ray emission from middle-aged pulsars," *Astrophys. J.*, **553**, 809-813.

32. Perna, R., Heyl, J. S., Hernquist, L. E., Juett, A. M., Chakrabarty, D. 2001, "Anomalous X-ray Pulsars and Soft Gamma-Ray Repeaters: Spectral Fits and the Magnetar Model," *Astrophys. J.*, **557**, 18-23.
33. Heyl, J. S., Hernquist, L. 2002, "Hotspot Emission from a Freely Precessing Neutron Star," *Astrophys. J.*, **567**, 510-514.
34. Heyl, J. S., Loeb, A. 2002, "Vacuum Decay Constraints on a Cosmological Scalar Field," *Phys. Rev. Lett.*, **88**, 121302 (3 pages).
35. Heyl, J. S., Shaviv, N. J. 2002, "QED and the High Polarization of the Thermal Radiation from Neutron Stars," *Phys. Rev. D*, **66**, 023002 (4 pages).
36. Heyl, J. S. 2002, "LMXBs may be important LIGO sources after all," *Astrophys. J. Lett.*, **574**, 57-60.
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(b) Conference Proceedings

(c) Other

2. NON-REFEREED PUBLICATIONS

(a) Journals

(b) Conference Proceedings

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1. Heyl, J. S., Shaviv, N. J., Lithwick, Y. 1999, “The Optics of Neutron-Star Magnetospheres,” *AAS/High Energy Astrophysics Division Meeting #31*, 10.01.
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6. Heyl, J., Lloyd, D., Shaviv, N. 2002, “What Could Polarimetry Tell Us About Neutron Stars?,” *ASP Conf. Ser. 271: Neutron Stars in Supernova Remnants*, 278.
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(c) Other

3. BOOKS

(a) Authored

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(c) Chapters

1. Heyl, J. S., 2004, “Neutron Stars”, *World Book Encyclopedia*.
2. Heyl, J. S., 2009 “Pulsars”, *World Book Encyclopedia*.

4. PATENTS

5. SPECIAL COPYRIGHTS

6. ARTISTIC WORKS, PERFORMANCES, DESIGNS

7. OTHER WORKS

8. WORK SUBMITTED (including publisher and date of submission)

1. Heyl, J. S., Richer, H., Anderson, J., Fahlman, G., Dotter, A., Hurley, J., Kalirai, J., Rich, R. M., Shara, M., Stetson, P., Woodley, K. H., Zurek, D. 2011, “Deep HST Imaging in NGC 6397: Stellar Dynamics,” *Astrophys. J.*, submitted (12 Oct 2011; 22 pages).
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9. WORK IN PROGRESS (including degree of completion)

1. Hoffman, K. and Heyl, J. S., “Properties of Neutron-Star Crusts”, 95% completed.
2. Prat, A. and Heyl, J. S., “Horizons in Schwarzschild-deSitter Spacetime”, 60% completed.
3. Thirumalai, A. and Heyl, J. S., “Magnetized, Dusty Winds”, 85% completed.
4. Gill, R. and Heyl, J. S., “Strongly Magnetized Neutron-Star Plasmas”, 90% completed.
5. Mazur, D. and Heyl J. S., “Quantum Fields in Astrophysics”, 90% completed.