

EVGENYA SHKOLNIK

DEPARTMENT OF TERRESTRIAL MAGNETISM
CARNEGIE INSTITUTION OF WASHINGTON

5241 Broad Branch Road, NW
Washington, DC
U.S.A. 20015

Phone: 202-478-8813
shkolnik@dtm.ciw.edu
<http://www.dtm.ciw.edu/shkolnik>

CURRENT POSITION Carnegie Postdoctoral Fellow, 2008 – Present
Department of Terrestrial Magnetism, Carnegie Institution of Washington

PREVIOUS POSITION NRC/NASA Postdoctoral Fellow, 2005 – 2008
NASA Astrobiology Institute, University of Hawaii

CURRENT RESEARCH ACTIVITIES

Extrasolar Planetary Systems & Young Low-Mass Stars:

Star-planet interactions as a probe of planetary and stellar magnetospheres.
Young M dwarfs in the solar neighborhood.
The search for and characterization of disks and planets around young M dwarfs.
Gas emission from planetary atmospheres and debris disks.
Effects of stellar radiation on the formation, evolution, and habitability of planets.

Astronomical Observations:

Extensive use of spectrographs at the Keck-I Telescope, IRTF, VLT, CFHT, the Gemini-South Observatory, the DAO, the McDonald Observatory, and Magellan telescopes. Space-based Observatories: MOST, GALEX, XMM, Chandra

Science Teams:

Gemini-South's Near-Infrared Coronagraphic Imager (NICI) Planet Search
MagIS: Magnetic Investigation of various classes of Stars
SPIRou: an upcoming NIR échelle spectropolarimeter for CFHT

EDUCATION

Ph.D. in Astronomy, University of British Columbia, 2004
Chromospheric Activity Induced by Short-Period Planets; A Search for Modulation of Ca II H & K Emission. Under the supervision of Prof. Gordon Walker

M.Sc. in Astronomy, University of British Columbia, 2000
Evolutionary and Pulsational Models of Metal-Poor Subdwarfs. Under the supervision of Prof. Jaymie Matthews

First-class Combined Honors B.Sc. in Physics and Mathematics, Dalhousie University, 1998, *Modeling the Evolution and Stellar Seismology of 51 Pegasi: Does the Planetary Companion Exist?* Under the supervision of Prof. David Guenther

SELECTED AWARDS

Natural Sciences and Engineering Research Council of Canada – Visiting Fellowship (declined), 2004

University Graduate Fellowship, University of British Columbia, 2003 – 2004

Jet Propulsion Laboratory Scholarship, CalTech, 1999

Atlantic Undergraduate Physics Conference: First prize student talk "*Seismology of the Stars: Indeed the Hottest Topic*", 1998

Burgess McKittrick Summer Research Studentship, Dalhousie University, 1995

FUNDING & GRANTS

UV Monitoring of Magnetic Star-Planet Interactions in the Hot Jupiter System HD 179949 with GALEX
PI of NASA grant – \$65,000, 2009

Identifying the missing young low-mass stars with the GALEX archive. II
Co-PI with M.C. Liu of NASA grant – \$45,000, 2008

Identifying the missing young low-mass stars with the GALEX archive. I
PI of NASA grant – \$68,000, 2007

Electromagnetic interactions between hot Jupiters and their host stars
Foreign PI of grant from the Taiwanese National Science Council – \$10,000, 2007

Characterizing extrasolar planets
PI of NRC Research Grant from the National Academies of Science – \$130,000, 2005–2007

PREVIOUS RESEARCH POSITIONS

Visiting Scientist at the Herzberg Institute of Astrophysics, 2002 – 2004

Graduate Research Fellow: Extrasolar Planet and Stellar Spectroscopy.
Supervisor: G. A. H. Walker, University of British Columbia, 2000 – 2004

Graduate Research Fellow: Asteroseismology; Evolution and pulsation models of metal-poor subdwarfs; Member of the MOST (Microvariability and Oscillations of Stars) Space Telescope science team.
Supervisor: J. Matthews, University of British Columbia, 1998 – 2000

Undergraduate Research Fellow: Stellar evolution and pulsation models.
Supervisor: D. B. Guenther, Saint Mary's University, 1997 – 1998

Summer Research Fellow: Solid State Physics; Scanning tunneling microscopy.
Supervisor: M. Jericho, Dalhousie University, 1995 & 1996

SELECTED SCIENTIFIC TALKS & COLLOQUIA

Invited speaker in 2008/9:

Nearby Young M dwarfs for Planet and Disk Searches

- Carnegie Institution of Washington
- National Capital Area Disk meeting, University of Maryland
- University of St. Andrews, Scotland
- University of Texas at Austin

Invited speaker in 2008/9:

Star-Planet Interactions, A Probe of Extrasolar Planetary Magnetic Fields

- Space Telescope Science Institute
- George Mason University
- Carnegie Institution of Washington
- NASA Goddard Space Flight Center
- U.S. Naval Research Laboratory

Review Talk: *Star-Planet Magnetic Interactions*

Contributed talk at the Canadian Astronomical Society Meeting (2009)

Session Convenor/Chair & Review Talk: *Star-Planet Interactions*

Cool Stars Meeting XV (2008)

Review Talk: *Star-Planet Magnetic Interactions*

IAU Meeting on the Magnetic Fields of the Cosmos (2008, unable to attend)

BD-225866, A Rare Low-mass Quadruple-lined Spectroscopic Binary

Contributed talk at the American Astronomical Society Meeting (2007)

Invited AAS Press Conference: *Four 's a Crowd: A Rare Quartet of Stars May Unlock Secrets of Stellar Evolution* (2007)

Winter AAS Meeting, Austin, TX

Invited talk *The On/Off Nature of Star-Planet Interactions* (2007)

Forum for Astrobiology Research, NASA Astrobiology Institute

Invited talk: *Identifying the Missing Nearby Young M Dwarfs for Disk and Planet Searches* (2007)

Herzberg Institute of Astrophysics/NRC, Victoria, BC

Invited talk: *Identifying the Missing Nearby Young M Dwarfs for Disk and Planet Searches* (2007)

Institute for Astronomy, University of Hawai'i

Invited talk: *ESPaDoNS: New Science with CFHT's New Spectrograph* (2006)

CFHT Headquarters, Waimea, HI

No Detectable H_3^+ in Hot Jupiter Atmospheres (2006)

Canadian Astronomical Society Meeting, Calgary, AB

Invited talk: *Magnetic Fields on Extrasolar Planets* (2005)

NASA Astrobiology Institute, University of Hawai'i

Spectral Signatures of Planet-Star Interactions (2005)
Centre for Star and Planet Formation Annual Meeting, Hilo, HI

Invited talk: *Spectral Signatures of Planet-Star Interactions* (2005)
Institute for Astronomy, University of Hawai'i

Magnetized Exoplanets (2005)
The 10th Anniversary of 51 Peg-b: Status of and Prospects for Hot Jupiter Studies –
International colloquium at the Observatoire de Haute Provence, France

Invited talk: *Magnetized Exoplanets* (2005)
Gemini-South Observatory, CTIO/NOAO, La Serena, Chile

Chromospheric Activity Induced by Short-Period Planets (2004)
Dissertation Talk, American Astronomical Society Meeting, Atlanta, GA

Invited AAS Press Conference: *Planet Creates Stellar Storm: First Evidence of an
Extrasolar Planet with a Magnetic Field* (2004)
Winter AAS Meeting, Atlanta, GA

Chromospheric Activity Induced by Short-Period Planets (2004)
CFHT User's Meeting, Campbell River, BC

Invited talk: *Evidence for Planet-Star Magnetic Interaction* (2003)
Herzberg Institute of Astrophysics, Victoria, BC

Evolution and Pulsation of Metal-Poor Subdwarfs (2001)
Canadian Astronomical Society annual conference, Hamilton, ON

Evolution and Pulsation of Metal-Poor Subdwarfs (2000)
MOST Space Mission Workshop, Vancouver, BC

*Characterizing Metal-Poor Subdwarfs and Extrasolar Planetary Systems: Targets for
the MOST Space Mission* (1999)
Canadian Space Agency's MOST Design Review, Vancouver, BC

TEACHING , COMMUNITY SERVICE AND SELECTED PUBLIC OUTREACH

Peer Reviewer: *The Astrophysical Journal, The Astronomical Journal, Monthly Notices of the
Royal Astronomical Society, Astronomy & Astrophysics, The Astrophysical Journal Letters,
Planetary & Space Science*, Telescope Observing proposals, NSF Review Panels

Carnegie Institution of Washington (DC)

Multimission Archive at Space Telescope Users Group Member, 2009 – 2012

Astronomy Seminar Series Coordinator, 2008 – 2010

University of Hawaii (Honolulu, HI)

Mentor of graduate students – 3 Ph.D. candidates at the Institute for Astronomy and 1 M.Sc. candidate in Computer Science

Graduate Admissions Committee Member, 2006

“*Astrobiology of Mars*” Journal Club – creator and co-ordinator, 2005 – 2006

Guest Lecturer, “*Computational Astrobiology*”

Ali'i Teacher Workshop: Invited lecturer, “*Planet-Hunting: Detection Methods of Extrasolar Planets*,” 2005 – 2007

Maui Community College: Invited scientist to NASA’s Deep Impact outreach program, 2005

University of Victoria (Victoria, British Columbia)

Introduction to Astronomy: Lab instructor, 2003

Introduction to Physics: Tutor, 2003

Stellar Physics: Frequent guest lecturer, 2003 and 2004

University of British Columbia (Vancouver, British Columbia)

Dominion Astrophysical Observatory Time Allocation Committee, 2003

Science Advisory Committee for the Faculty of Science, 2002

Introduction to Astronomy for science majors: Lab instructor, 1998 – 2002

Stellar Astrophysics: Tutor, 1998 – 2002

Let’s Talk Science: Volunteer; an organization which brings science graduate students to public school classrooms, 1998 – 2003

Science 101: Volunteer lecturer. This program brings science education to under-privileged adults, 2001 & 2002

Science World (Vancouver, British Columbia)

Loon Lake Summer Camp for Educators – Workshop leader; teaching instructors techniques for bringing science into the classroom, 2001 & 2002

Lectures at Science World's yearly events such as *Opening the Doors*, *Networking in Science*, and *XX Night: Women in Science*, 2000 – 2002

Tele-mentoring Young Women in Science, 2004 – 2005

H.R. Macmillan Space Center (Vancouver, British Columbia)

Royal Astronomical Society of Canada – Invited speaker

Teacher's Week – Workshop leader, 2001 & 2002

Girls' Nights – Speaker, making physics and astronomy accessible to young girls, 2000 & 2001

Dalhousie University (Halifax, Nova Scotia)

Introduction to Physics for science majors: Lab instructor, 1995 – 1998

Coordinator of *Computer Assisted Physics Assignments (C.A.P.A.)*: Implementing a computer-based homework system for first-year physics courses, 1997

Science & Innovators in the Schools: Volunteer speaker, 1995 – 1998

PROFESSIONAL MEMBERSHIPS

American Astronomical Society, 2002 – present

Canadian Astronomical Society, 1998 – present

Society for Women in Science and Technology, 2000 – 2005

Science Team for Canada's MOST Space Telescope Mission, 1998 – 2002

History and Philosophy of Science Society, 2000 – 2001

LANGUAGES

English, Russian, Hebrew and working knowledge of Spanish and French

PUBLICATIONS IN REFEREED JOURNALS

New Constraints to the Orbit of the Planet Candidate VB 10 using Doppler Spectroscopy
Anglada-Escudé, G., **Shkolnik, E.**, Weinberger, A. J., Thompson, I., Osip, D., Debes, J. (2009)
The Astrophysical Journal Letters, submitted

Thirty New Low-Mass Binaries

Shkolnik, E., Hebb, L., Liu, M.C., Reid, I.N., Cameron, A. C. (2009), The Astrophysical Journal, submitted

Identifying the Young Low-mass Stars within 25 pc. I. Spectroscopic Observations

Shkolnik, E., Liu, M.C., Reid, I.N. (2009), The Astrophysical Journal, 699, 649-666
[Highlighted in Nature]

Magnetic cycles of the planet-hosting star Tau Bootis: II. a second magnetic polarity Reversal

Fares, R.; Donati, J. -F.; Moutou, C.; Bohlender, D.; Catala, C.; Deleuil, M.;
Shkolnik, E.; Cameron, A. C.; Jardine, M. M.; Walker, G. A. H. (2009), Monthly Notices of the
Royal Astronomical Society, 398, 1383-1391
[Reported on by the American and European press.]

2MASS 22344161+4041387AB: A Wide, Young, Accreting, Low-Mass Binary in the LkHa233 Group

Allers, K. N.; Liu, M.C.; **Shkolnik, E.**; Cushing, M.C.; Dupuy, T. J.; Mathews, G. S.; Reid, I. N.; Cruz, K. L.; Vacca, W. D. (2009) The Astrophysical Journal, 697, 824-835

Magnetic cycles of the planet-hosting star τ Bootis

Donati, J.-F.; Moutou, C.; Fares, R.; Bohlender, D.; Catala, C.; Deleuil, M.;
Shkolnik, E.; Cameron, A. C.; Jardine, M. M.; Walker, G. A. H. (2008) Monthly
Notices of the Royal Astronomical Society, 385, 1179-1185
[Reported on by the American and European press.]

BD -22°5866: A Rare Low-mass Quadruple-lined Spectroscopic Binary

Shkolnik, E., Liu, M.C., Reid, I.N. (2008), The Astrophysical Journal, 682, 1248-1255
[Reported on by the American and European press.]

The On/Off Nature of Star-Planet Interactions

Shkolnik, E., Bohlender, D. A., Walker, G. A. H. (2008) The Astrophysical Journal, 676, 628-638
[Reported on by the American and European press.]

MOST Detects an Active Spot on τ Bootis Induced by its Planetary Companion

Walker, G.A.H., Croll, B., Matthews, J., Kuchnig, R., Huber, D., Weiss, W.W.,
Shkolnik, E., Rucinski, S.M., Guenther, D.B., Moffat, A., Sasselov, D. (2008) Astronomy &
Astrophysics, 482, 691-697

The Magnetic Field of the Planet-hosting Star τ Bootis

Catala, C., Donati, J.-F., **Shkolnik, E.**, Bohlender, D., Alecian, E. (2007) Monthly Notices of the
Royal Astronomical Society-Letters, 374, 42-46

No Detectable H₃⁺ in the Atmospheres of Hot Jupiters

Shkolnik, E., Gaidos, E. , Moskovitz, N. (2006), *The Astronomical Journal*, 132, 1267-1274

Interactions Between Hot Jupiters and Their Host Stars

Gu, P.-G., **Shkolnik, E.**, Li, S.-L., Liu, X.-W. (2005), *Astronomische Nachrichten*, 326, 909-912

Investigating Ca II Emission in the RS Canum Venaticorum Binary ER Vulpeculae Using the Broadening Function Formalism

Shkolnik, E., Walker, G. A. H., Rucinski, S. M., Bohlender, D. A., Davidge, T. J. (2005), *The Astronomical Journal*, 130, 799-808

Hot Jupiters and Hot Spots: The Short- and Long-term Chromospheric Activity on Stars with Giant Planets

Shkolnik, E., Walker, G.A.H., Bohlender, D.A., Gu, P.-G., Kürster, M. (2005), *The Astrophysical Journal*. 622, 1075-1090

Differential Rotation in the Active G5V Star κ^1 Ceti: Space-based Photometry from MOST

Rucinski, S.M., Walker, G.A.H., Matthews, J.M., Kuschnig, R., **Shkolnik, E.**, Marchenko, S., Bohlender, D.A., Guenther, D.B., Moffat, A.F.J., Sasselov, D., Weiss, W.W. (2004), *Publications of the Astronomical Society of the Pacific*. 116, 1093-1104

Evidence for Planet-Induced Chromospheric Activity on HD 179949

Shkolnik, E., Walker, G.A.H., Bohlender, D.A. (2003), *The Astrophysical Journal*. 597, 1092-1096

[Reported on by the American and European press.]

The Radial Velocity Precision of Fiber-fed Spectrographs

Walker, G.A.H., **Shkolnik, E.**, Bohlender, D.A., Yang, S. (2003), *The Publications of the Astronomical Society of the Pacific*. 115, 700-705

Chromospheres, Flares and Exoplanets

Cuntz, M. & **Shkolnik, E.** (2002), *Astronomische Nachrichten*. 323, 387-391

OTHER REFEREED PUBLICATIONS & CONFERENCE PROCEEDINGS

Magnetospheric Emissions from Extrasolar Planets

Lazio, J.; Bastian, T.; Bryden, G.; Farrell, W.M.; Griessmeier, J.-M.; Hallinan, G.; Kasper, J.; Kuiper, T.; Lecacheux, A.; Majid, W.; Osten, R.; **Shkolnik, E.**; Stevens, I.; Winterhalter, D.; Zarka, P. (2009) *Astro2010: The Astronomy and Astrophysics Decadal Survey*, Science White Papers, no. 177

Star-Planet Interactions - REVIEW

Shkolnik, E.; Aigrain, S.; Cranmer, S.; Fares, R.; Fridlund, M.; Pont, F.; Schmitt, J.; Smith, A.; Suzuki, T. (2009) *Proceedings of the 15th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun*. AIP Conference Proceedings, Volume 1094, pp. 275-282

The Gemini NICI Planet-Finding Campaign

Liu, M. C.; Wahhaj, Z.; Biller, B.; **Shkolnik, E.**; Chun, M., et al. (2009) Proceedings of the 15th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun. AIP Conference Proceedings, Volume 1094, pp. 461-464

Spectropolarimetry of Hot Jupiter systems

Farès, R.; Donati, J.-F.; Moutou, C.; **Shkolnik, E.**; Bohlender, D. (2009) Proceedings of the 15th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun. AIP Conference Proceedings, Volume 1094, pp. 437-440

The On/Off Nature of Star-Planet Interactions

Shkolnik E., Bohlender, D.A., Walker, G.A.H. (2007) Exoplanets: Detection, Formation and Dynamics: International Astronomical Union: Symposium no. #249, Suzhou, China

Magnetised Exoplanets

Shkolnik E., Walker, G.A.H., Bohlender, D.A., Gu, P.-G., Kürster, M. (2005). Tenth anniversary of 51-Peg-b: Status of and Prospects for Hot Jupiter Studies. Proceedings of Haute Provence Observatory Colloquium (22-25 August, 2005). Edited by L. Arnold, F. Bouchy, & C. Moutou.

Precise Photometry of 51 Peg Systems with MOST

Walker, G., Matthews, J., Rainer, K., Rowe, J., Guenther, D., Moffat, F., Rucinski, S., Sasselov, D., Seager, S., **Shkolnik, E.**, Weiss, W. (2005). Tenth anniversary of 51-Peg-b: Status of and Prospects for Hot Jupiter Studies. Proceedings of Haute Provence Observatory Colloquium (22-25 August, 2005). Edited by L. Arnold, F. Bouchy, & C. Moutou.

Stellar Activity Enhancement by Planets: Observations

Saar, S., **Shkolnik, E.**, Cuntz, M. (2003) Stars as Suns: APS Conference Series, in press. Activity, Evolution and Planets, International Astronomical Union: Symposium no. 219, Sydney, Australia

Modulation of Ca II H&K Emission by Short Period Planets

Shkolnik E., Walker, G.A.H., Bohlender, D.A. (2003). Proceedings of Scientific Frontiers in Research on Extrasolar Planets, Edited by D. Deming & S. Seager. APS Conference Series Vol. 294: 157 – 160

Ultraprecise Photometry from Space: Exploring Pulsations with the "Hubble Space Telescope"

Matthews, J.M., Kuschnig, R., **Shkolnik, E.** (2001). Proceedings of the SOHO 10/GONG 2000 Workshop: Helio- and Asteroseismology at the Dawn of the Millennium, 2-6 October 2000, Santa Cruz de Tenerife, Tenerife, Spain. Edited by A. Wilson, Scientific coordination by P. L. Pallé. ESA SP-464, Noordwijk: ESA Publications Division, ISBN 92-9092-697-X, p. 385 – 390

Ultraprecise Photometry from Space: The MOST Microsat Mission

Matthews, J., Kuschnig, R., Walker, G., Pazder, J., Johnson, R., Skaret, K., **Shkolnik, E.**, Lanting, T., Morgan, J. P., Sidhu, S. (2000). The Impact of Large-Scale Surveys on Pulsating Star Research, ASP Conference Series, 203: 74 – 75. IAU Colloquium #176. Edited by L. Szabados and D. Kurtz

CONFERENCE POSTERS

SPI or Spin-up? An UV Investigation of Activity on Exoplanet Host Stars (2010)

Shkolnik, E.

American Astronomical Society Meeting 215, Washington, DC

Exoplanet Detection Combining Astrometric and Radial Velocity Measurements. Application to VB10b (2010)

Anglada-Escudé, G, **Shkolnik, E.**, Weinberger, A, Thompson, I., Osip, D.

American Astronomical Society Meeting 215, Washington, DC

The Gemini NICI Planet-Finding Campaign (2010)

Liu, M. C., Wahhaj, Z., Biller, B., Chun, M., Close, L., Ftaclas, C., Hartung, M., Hayward, T.,

Nielsen, E., Toomey, D., **Shkolnik, E.**, Reid, I., NICI Planet-Finding Campaign Team

American Astronomical Society Meeting 215, Washington, DC

Identifying the Young M dwarfs within 25 pc (2008)

Shkolnik, E., Liu, M., Reid, N.

IAU Symposium on the Ages of Stars

New Insights into Star-Planet Interactions (2007)

Shkolnik, E., Bohlender, D., Walker, G.

American Astronomical Society Meeting 210, Honolulu, HI

Possible Detection of Planet-induced X-ray Emission in the HD 179949 System (2006)

Saar, S., Kashyap, V., Cuntz, M., **Shkolnik, E.**, Hall, J.

Cool Stars 14 Meeting, Pasadena, CA

Identifying the Missing Population of Nearby Young M Dwarfs (2006)

Shkolnik, E., Liu, M., Reid, N.

Bulletin of the American Astronomical Society, 38, 89

In Search of H_3^+ from Extrasolar Planetary Atmospheres (2005)

Shkolnik, E., Gaidos, E., Moskovitz, N.

Protostars and Planets V, Hawai'i

Has OGLE-TR-132B been undergoing a Significant Orbital Decay Due to Stellar Tides? (2005)

Gu, P.-G., Li, S.-L., **Shkolnik, E.**, Liu, X.-W.

Protostars and Planets V, Hawai'i

Detecting Planet-Star Interactions (2005)

Shkolnik, E., Walker, G., Bohlender, D., Gu, P.-G., Kürster, M.

NASA Astrobiology Institute Biennial Meeting, Boulder, CO

Magnetic Interaction between Stars and Hot Jupiters as Observed in Ca II H & K Emission - An Update (2005)

Shkolnik, E., Walker, G., Bohlender, D., Gu, P.-G., Kürster, M.

American Astronomical Society Meeting, San Diego, CA

Stellar Activity Enhancement by Planets: Theory and Observations (2004)

Saar, S.H., Cuntz, M., **Shkolnik, E.**

Stars as Suns: Activity, Evolution and Planets, ed. A. Dupree & A. Benz, Proc. IAU Symposium, 219, 355

Chromospheric Activity Induced by Short-Period Planets (2003)

Shkolnik, E., Walker, G. & Bohlender, D., Rucinski, S.
American Astronomical Society Meeting, Washington, DC

Further Evidence for Planet-Star Interaction in Five Short-Period Systems (2002)

Shkolnik, E., Walker, G., Bohlender, D.
American Astronomical Society Meeting, Seattle, WA

Radial Velocity Precision Possible with a Fibre-fed Spectrograph (2002)

Walker, G., **Shkolnik, E.**, Bohlender, D., Yang, S.
American Astronomical Society Meeting, Seattle, WA

Modulation of Ca II H & K Emission by Extrasolar Planets (2002)

Shkolnik, E., Walker, G., Bohlender, D.
Canadian Astronomical Society Conference, Penticton, BC

Modulation of Ca II H & K Emission by Extrasolar Planets (2001)

Shkolnik, E., Walker, G., Bohlender, D.
American Astronomical Society Meeting, Washington, DC

Oldest Stars, Newest Worlds: Targets for the MOST Space Mission (1999)

Shkolnik, E., Matthews, J., Guenther, D.
Canadian Astronomical Society annual conference, Halifax, NS