

# Curriculum Vitae – Gáspár Áron Bakos

## Current position:

Assistant professor at the Department of Astrophysical Sciences at Princeton University, 133 Peyton hall, 4 Ivy lane, Princeton, NJ 08544

## Education:

- *University (graduate)*: Eötvös Lóránd University (ELTE), Budapest, Astrophysics Section, 2000–2004. PhD completed in October, 2004, with *summa cum laude*. Adviser: Dr. G. Kovács.
- *University (graduate)*: Predoctoral Fellow at the Harvard-Smithsonian Center for Astrophysics (CfA), 2001, 2002, 2003. Advisers: D. Sasselov and R. W. Noyes.
- *University (MSc)*: ELTE, astronomy, 1994–2000. Adviser: Dr. G. Kovács.
- *University (MSc)*: ELTE, astro- and statistical physics, 1994–2000. Adviser: Dr. G. Kovács.
- *Secondary school*: Apáczai Csere János Gimnázium of Eötvös University, Budapest, specialized in natural sciences.

## Appointments:

- 2011 Sep–: *Assistant Professor*, Princeton University, Department of Astrophysics.
- 2010–2011: *Astrophysicist*, Smithsonian Astrophysical Observatory (SAO).
- 2007–2010: *National Science Foundation Postdoctoral Fellow*, CfA. Supervisor: R. W. Noyes. Topic: Search for extrasolar planets with the HAT Network.
- 2004–2007: *Hubble Postdoctoral Fellow*, CfA. Supervisor: K. Stanek. Topic: Search for extrasolar planets with the HAT Network.
- 2001, 2002, 2003: *Predoctoral fellow*, CfA. Supervisors: R.W. Noyes, D. Sasselov. Topic: Development and operation of the HAT Network for monitoring all sky variability.
- 2000, 2001, 2002: *Research fellow*, Konkoly Observatory, Budapest, supervisor: G. Kovács. Development and construction of an autonomous observatory.
- 1998–2000: *Research assistant*, Konkoly Observatory, supervisor: G. Kovács.
- 1991–1993: *Observing assistant*, Uránia Public Observatory, Budapest.

## Awards:

- 2014 (upcoming): The Beatrice M. Tinsley Research Scholar Award (UT, Austin).
- 2012: Packard Fellowship for Science and Engineering
- 2012: Alfred P. Sloan Research Fellow
- 2011: Muhlmann Award of the Astronomical Society of the Pacific
- 2010: Newton Lacy Pierce Prize of the American Astronomical Society
- 2008: Paul Hertelendy Lecturer, Center for Astrophysics
- 2007: National Science Foundation Postdoctoral Fellowship

- 2007: Popular Science Annual Brilliant 10 Award (youngest awardee).
- 2004: Hubble Postdoctoral Fellowship
- 2003: Dan David Prize Scholars of the Tel-Aviv University
- 1998, 1999, 2000: Scholarship of the Republic of Hungary
- 1999: “Eminent Student of the Faculty of Sciences” award at Eötvös University, Budapest.
- 1999: First prize at the biennial Scientific Conference of Hungarian University Students.

**Grants:**

- NASA Origins, “Operating an Improved HAT Network to Discover and Characterize Many Planets, from Super-Earths to Super-Jupiters, Transiting Bright Stars”, PI, 2012, 991.2K USD
- David and Lucile Packard Foundation, PI, 2012, 875K USD
- Alfred P. Sloan Foundation, PI, 2012, 50K USD
- JPL RSA/1451281, Keck, “Exploring the diversity of Exoplanets through confirmation spectroscopy VI”, PI, 2012, 17.6K USD
- JPL RSA/1441579, Keck, “Exploring the diversity of Exoplanets through confirmation spectroscopy”, PI, 2011, 16.6K USD
- NSF AST-1108686, “From Hot Jupiters to Super Earths with HATNet and HATSouth”, PI, 2011, 742K USD
- JPL RSA/1424360, Keck, “Exploring the diversity of Exoplanets through confirmation spectroscopy VI”, PI, 2010, 20.4K USD
- JPL RSA/1396270, Keck, “Exploring the diversity of Exoplanets through confirmation spectroscopy V”, PI, 2010, 19K USD
- JPL RSA/1388733, Keck, “Exploring the diversity of Exoplanets through confirmation spectroscopy IV”, 2009, PI, 29.5K USD
- JPL RSA/1367404-1, Keck, “Exploring the diversity of Exoplanets through confirmation spectroscopy I”, 2009, PI, 24K USD
- NASA Origins grant NNX09AB29G, 2009–2013, “Operating a Global Network of Southern Hemisphere Automated Telescopes to Detect and Characterize a Multitude of Transiting Exoplanets”, PI, 921K USD.
- JPL RSA/1376302, “Exoplanet HAT-P-11b secondary eclipse observations”, Co-I, 2009, 15K USD
- SAO IR&D proposal, “Preparations for HAT-South”, 2009, PI, 123K USD
- NASA Origins grant NNX08AF23G, 2008–2011, “HATNet Detection and Characterization of Exoplanets Transiting Bright Stars”, PI, 565K USD.
- JPL RSA, Keck/1346426-1, “Exploring the diversity of Exoplanets through confirmation spectroscopy II”, 2008, PI, 20K USD
- JPL RSA/1360263, 2008–2010, “New Transiting Exoplanets, Spitzer Target of Opportunity”, Co-I, 2008, 25K USD

- SAO IR&D proposal, “Preparations for HAT-South”, 2008, PI, 75.2K USD
- NSF Major Research Instrumentation grant NSF/AST-0723074, 2007–2009, “Acquisition of a 3-station global network of automated telescopes to detect a large number of nearby transiting extrasolar planets”, PI, 719K USD.
- Spitzer Space Telescope DDT grant JPL RSA/1314871 , “HAT-P-2b: A Direct Glimpse at the Stormiest Exoplanet”, 2007, PI, 99K USD.
- SAO RE proposal, “Upgrade of HATNet”, 2007, PI, 69K USD
- OTKA K-60750, 2006–2010, “Extrasolar planet and variable star research by wide-field photometry”, Co-I, 78K USD
- NASA Origins grant NNG04LG89G, 2004–2008, “Spreading the Net: A Network of Small Automated Telescopes for Detecting Transiting Extrasolar Planets” (PI: Noyes), Co-I, 800K USD
- Hungarian Scientific Research Fund (OTKA) K-38437, 2002–2005, “Reduction and analysis of large-scale variable star data sets”, Co-I, 56.5K USD

#### **Short-term Fellowships:**

- 1999 (two months): summer student, Space Telescope Science Institute (STScI). Host: K. Sahu. Purpose: examination of high proper motion stars and follow-up of microlensing events (PLANET collaboration).
- 1998 (three and a half months): summer student, STScI, Host: K. Sahu.

#### **Short visits:**

- Australian National University, Canberra, and Siding Springs Observatory; numerous visits since 2008, for the installation and operation of HAT-South.
- HESS observatory of Max Planck Institute, Namibia; numerous visits since 2007.
- Las Campanas Observatory, Chile; numerous visits since 2007 for scientific collaboration related to the HAT-South project.
- Fred Lawrence Whipple Observatory (FLWO), Arizona; numerous visits since 2002 for operations of the FLWO node of the HAT Network.
- Submillimeter Array (SMA), Mauna Kea, Hawaii. Multiple visits since 2011 regarding operation of the Mauna Kea node of HATNet.
- Princeton University Observatory, numerous visits between 2000 and 2006. Host: B. Paczyński. Purpose of visit: designing fully automated telescopes for massive variability search.
- Wise Observatory, visit in 2003. Host: T. Mazeh. Purpose: installation of the Wise HAT telescope.
- Konkoly Observatory, Budapest. Numerous visits since 2003. Host: G. Kovács. Purpose: collaboration on planetary transit search algorithms and the Wise HAT telescope.
- Steward Observatory, University of Arizona, approx. 6 visits in the period 2000 – 2003. Purpose: install HAT-1 telescope to Kitt Peak, and collaborate with UA.

**Teaching:**

- AST205, “Planets in the Universe” (undergraduate), 2012, Princeton
- AST205, “Planets in the Universe” (undergraduate), 2013, Princeton
- AST542, “Seminar in observational astrophysics” (graduate), 2014, Princeton

**Conferences:**

- *International Astronomical Union Symposium 299: Exploring the Formation and Evolution of Planetary Systems*, Victoria, BC, Canada, 2013, poster.
- *Exoplanets in the Post-Kepler Era*, CfA, Cambridge, MA, USA, 2013.
- *1st Doha International Astronomy Conference "Gravitational Microlensing - 101 years from theory to practice*, Doha, Qatar, 2013, invited talk.
- *Max Planck Institute for Extraterrestrial Physics*, München, Germany, 2012, Hot Planets and Cool Stars conference, invited talk.
- *Sagan Exoplanet Summer Workshop* Pasadena, California, 2012 July, invited talks.
- *Annual meeting of the American Astronomical Society (AAS)*, Austin, Texas, 2012 January, Pierce-prize talk.
- *Telescopes from Afar*, Canada French Hawaii Telescope, 2011 March, talk.
- *Detection and dynamics of transiting exoplanets*, Observatoire de Haute-Provence, France, 2010 August, talk.
- *2010 Sagan Exoplanet Summer Workshop: Stars as Homes for Habitable Planetary Systems*, NASA Exoplanet Science Institute, California Institute of Technology, Pasadena, CA, 2010 July, invited talk (workshop speaker).
- *Exoplanets Rising: Astronomy and Planetary Science at the Crossroads*, Kavli Institute for Theoretical Physics, UC Santa Barbara, CA, 2010 April, invited talk.
- *Keck Science meeting*, Pasadena, CA, 2009 September, talk.
- *New Technologies for Probing the diversity of brown dwarfs and exoplanets*, Shanghai, 2009 July, talk.
- *National Science Foundation Astronomy and Astrophysics Postdoctoral Fellows symposium*, 2009, Long Beach, CA, USA, talk.
- *Transiting Planets, IAU Symposium 253*, 2008, Cambridge, MA, USA, invited talk.
- *Transiting Extrasolar Planets Workshop*, 2006, MPIA, Heidelberg, invited talks.
- *Ground-based transit surveys, target selection and observing strategy*, 2006, Geneva, invited review.
- *Hubble Fellows Symposium*, 2004, 2005, 2006, Baltimore, MD, USA, talk in each year.
- *Aspen Conference on Planet Formation and Physics*, 2005, Aspen, CO, poster.
- *Jenam*, 2003, Budapest, invited talk.
- *IAP Coll. 200, Extrasolar Planets*, 2003, Paris, poster.
- *Scientific Frontiers in Research on Extrasolar Planets*, 2002, Washington D.C., poster.

- *IAU Coll. 183*, Kenting, Taiwan, 2001 (talk, poster), Small Telescope Astronomy on global scales (talk, poster, conf. series publication).
- *IAU Coll. 176*, Budapest, 1999 (poster), The Impact of Large-Scale Surveys on Pulsating Star Research (poster).
- *X. Winter School of the IAC*, Canary Islands, 1998 (poster).

**Presentations:**

- Colloquium at the Princeton Plasma Physics Lab, Princeton, 2014.
- Special colloquium at the Department of Astrophysical Sciences, Princeton University, 2013.
- Colloquium at the University of California at Los Angeles, Department of Physics, 2013.
- Colloquium at University of Michigan, Department of Physics, 2013.
- Colloquium at Rutgers University, Department of Physics, 2013.
- Colloquium at the Carnegie Institution for Science (Pasadena), 2012.
- Talk at the Sagan 2012 Workshop, “Validation and Confirmation of Transit Signals”.
- Talk at the Sagan 2012 Workshop, “Ground-based Surveys and Transits”.
- Colloquium at the Las Cumbres Observatory Global Telescope (LCOGT), 2012.
- Invited talk at the NASA Exoplanet Science Institute (NexSci).
- Pierce-prize talk at the 2012 AAS.
- Talk at the “Telescopes from Afar” conference, 2011.
- Talk at the “Detection and dynamics of transiting exoplanets” conference, Observatoire de Haute-Provence, 2010 August.
- Workshop speaker at the Sagan Exoplanet Summer Workshop, 2010 July.
- Invited talk at the Exoplanets Rising KITP conference, 2010 April.
- Colloquium at the Carnegie Institution for Science, Pasadena, California, 2010 March 2.
- Presentation at the CfA for Eva Pell, Under Secretary for Science of Smithsonian, 2010 March 1.
- Ohio State University colloquium, “Exploring the diversity of extrasolar planets with the HATNet project”, Columbus, Ohio, 2010 January
- Columbia University colloquium, “Exploring the diversity of extrasolar planets with the HATNet project”, New York, 2009 December.
- Pontificia Universidad Católica de Chile colloquium, “Who is under that HAT”, Santiago, Chile, 2009 November.
- Keck Science meeting, “HATNet exoplanets confirmed by Keck”, Caltech, Pasadena, 2009 September.
- Presentation at the Institute for Theory and Computation Luncheon, CfA, 2009 September.

- Presentation for the Science and Space Programs, Office of Management and Budget for the White House, “Small telescopes provide big results”, CfA, 2009 July.
- Presentation for the Visit by Smithsonian Regents Chair at the Center for Astrophysics, CfA, 2009 May.
- Konkoly Observatory colloquium, 2009 February.
- National Science Foundation Astronomy and Astrophysics Postdoctoral Fellows symposium, Long Beach, CA, 2009 January.
- Australian National University, invited talk, 2008 June.
- IAU Symposium 253, “Transiting extrasolar planets with HATNet”, Cambridge, MA, May 2009.
- Institute for Astronomy, University of Hawaii colloquium, 2008 May.
- Paul Hertelendy lecture/prize, Harvard Smithsonian Center for Astrophysics, 2008 May.
- Space Telescope Science Institute colloquium, 2008 March.
- Transiting Extrasolar Planets Workshop, MPIA, Heidelberg, 2006, invited talk “Photometric methods in transit searches”..
- Transiting Extrasolar Planets Workshop, MPIA, Heidelberg, 2006, invited talk “Current status of HATNet”.
- Konkoly Observatory Colloquium, Budapest, 2006, “Planet HAT-P-1”..
- Geneva Observatory, 2006, Switzerland, “Ground-based transit surveys, target selection and observing strategy” (invited talk on “Detection and characterization of exoplanets” conference).
- National Academy of Sciences, Cambridge, MA, 2006, “Origins of life retreat”, “Current status of search for extrasolar planets with HATNet”.
- Harvard-Smithsonian Center for Astrophysics (CfA), Optical and Infrared Astronomy lunch talk, Cambridge, MA, 2006, “Current status of the search for extrasolar planets with HATNet”.
- Space Telescope Science Institute (STScI), Hubble Fellows symposium, Baltimore, 2006, “A stellar companion in the HD 189733 system with a known transiting planet”.
- Konkoly Observatory Colloquium, Budapest, 2006, “A stellar companion in the HD 189733 system”.
- CfA, Solar, Stellar, and Planetary Sciences seminar, Cambridge, MA, 2005, “Needle in the haystack: search for extrasolar planetary transits with HATNet”.
- Space Telescope Science Institute (STScI), Hubble Fellows symposium, Baltimore, 2005, “Search for extrasolar planets with HATNet”.
- CfA, Solar, Stellar, and Planetary Sciences seminar, Cambridge, MA, 2004, “Photometry with the HAT Network”.
- Jenam conference, Budapest, 2003, “Current status of the HAT” (invited talk).

- Harvard-Smithsonian Center for Astrophysics (CfA) Solar, Stellar, and Planetary Sciences seminar, Cambridge, MA, 2003, “Building the HAT Network”.

### **Thesis Adviser and Postgraduate-Scholar Sponsor:**

- G. Zhou, third year graduate student at the Australian National University, co-advising during his visit to Princeton, 2013–.
- J. Greco, first year graduate student at Princeton, semester project, 2013–.
- M. de Val Borro, postdoctoral fellow at Princeton, 2012–.
- W. Bhatti, postdoctoral fellow at Princeton, 2012–.
- X. Huang, third year graduate student at Princeton. 2011–.
- B. Béky, visiting student at the CfA, 2009–2010, Harvard graduate student 2010–2012.
- J. Hartman, postdoctoral fellow at the CfA, 2008–2011, associate research scholar at Princeton, 2011–.
- K. Penev, postdoctoral fellow at the CfA, 2009–2011, associate research scholar at Princeton, 2011–.
- D. Kipping, predoctoral fellow, PhD thesis co-adviser at the CfA, 2009–2010 (currently Sagan and Menzel fellow at the CfA).
- Z. Csubry, visiting student, CfA, 2007–2011, technical research staff at Princeton, 2011–.
- G. Perumpilly, postdoctoral fellow at the CfA, 2009-2010.
- A. Pál, PhD thesis co-adviser, 2004–2009, graduated 2009 with *summa cum laude*. (current position: postdoctoral fellow at Konkoly Observatory).
- B. Sipócz, visiting student at the CfA, 2007–2009, MsC thesis adviser. (currently Marie Curie fellow at University of Hertfordshire).
- Gábor Kovács, visiting student at the CfA, 2007–2009. (current position: graduate student, University of Cambridge, UK).
- B. Csák: predoctoral fellow at the CfA, 2004–2005. (currently at the Gothard Observatory).

### **Undergraduate Adviser:**

- Eric Bolton, Princeton, 2013 (JP)
- Michael Zhang, Princeton, 2013–2014 (Senior Thesis)
- Benjamin Cook, Princeton, 2012 (JP)

### **Significant Collaborations:**

- HATNet includes collaborators from the Harvard Smithsonian center for Astrophysics, Konkoly Observatory (Budapest), Niels Bohr Institute (Copenhagen), L’Observatoire de Haute-Provence, and numerous US based universities.
- HATSouth is an international collaboration between Princeton University, the Australian National University, the Max Planck Institute for Astronomy, and Pontificia Universidad Católica de Chile. We also collaborate with the University of New South Wales and Carnegie Observatories.

### Professional Societies:

American Association for the Advancement of Science, 2010–present.

Hungarian Astronomical Association, member: 1991–present.

American Astronomical Association, member: 2008–present.

### Research interests (in order of relevance to current research:)

- Transiting extrasolar planets, characterization of exoplanets.
- Time-domain astronomy, all sky surveys.
- Massive variability searches, bright variable stars.
- Instrumentation: automated telescopes and observatories.
- Astrometry and photometry algorithms and techniques.
- Globular cluster variables, RR Lyrae stars.
- High proper motion stars, solar neighborhood.
- Transient phenomena, afterglows of GRBs.

### Dedicated telescopes:

- HATNet at FLWO: Installation and maintenance of the HAT-5,-6,-7,-10 wide-field, automated telescopes at FLWO. Operational since 2003. Goal: search for planetary transits.
- HATNet at SMA, Hawaii: Installation and maintenance of HAT-8 and HAT-9. Operational since 2004. Goal: search for planetary transits.
- FLWO: Installation and maintenance of TopHAT, dedicated 0.25m photometry follow-up telescope (2006–).
- Wise HAT (WHAT) at Wise Observatory, Israel: Installation and maintenance. Operational 2004–2009. Goal: search for planetary transits.
- HAT-South at Las Campanas, Chile: installation and operations of HAT-South 1 (HS1) and HS2 wide field robotic telescopes.
- HAT-South at the HESS site, Namibia: installation and operation of HS3 and HS4.
- HAT-South at Siding Springs, Australia: installation and operation of HS5 and HS6.

### Recent telescope time awards:

- *Subaru 8 m telescope*, PI, “Confirmation of HATNet Transiting Hot Jupiter Candidates Using Subaru/HDS”, 2009B: 3 nights, 2010A: 3n, 2011A: 1n, 11B: 2n, 12A: 1.5n, 12B: 4n
- *Keck 10 m telescope*, PI, “Exploring the Diversity of Exoplanets through Confirmation”, NOAO and NASA allocations, 2007A (1.5n), 2007B (1.5n), 2008A (3n), 2008B (3n), 2009A (3n), 2009B (5.5n), 2010A (3.5n), 2010B (5n), 2011A (3.5n), 2011B (2.9n), 12A (2.9n), 13B (0.5n); altogether 35.8 nights on 20 runs.
- *ANU 2.3 m telescope*, Co-I, “Stellar Parameters and Radial Velocities for Transiting Exoplanet Candidates”, 2010A: 3n, 2009C: 5n, 2010C: 3n, 2011Q1(a): 11n, 2011Q2: 9n, 2011Q3: 10n, 2011Q4: 11n, 2012Q1: 10n, 2012Q2: 10n, 2012Q3: 15n, 2012Q4: 9n, 2013Q1: 11n, 2013Q2: 8n, 2013Q3: 8n.



- *AAT 3.9 m telescope*, Co-I, “Radial Velocity Follow Up of HAT-South Transiting Planet Candidates”, 2011B: 14n, 2012A: 12n, 2012B: 21n, 2013A: 20n, 2013B: 11n.
- *Du Pont 2.5 m telescope*, Co-I, “Stellar Parameters and Radial Velocities for Transiting Exoplanet Candidate Stars”, 2009: 4n, 2010: 6n, 2011: 8n, 2012: 6n, 2013: 3n.
- *OHP 1.97 m telescope* with the SOPHIE spectrograph, Co-I, 2006–2013, several nights per semester.
- *Swiss 1.2 m Euler telescope* with the CORALIE spectrograph, Co-I, “Exploring the Diversity of Exoplanets through Confirmation of Transit Candidates using CORALIE”, 2009A:6n, 2010B:6n, 2011A:6n, 2012:12n, 2013:10n.
- *FLWO 1.5 m Tillinghast* reflector with the Digital Speedometer and TRES spectrographs, Co-I, 2004–2013, several nights per year.
- *FLWO 1.2 m* reflector with KeplerCam, PI, 2004–2011, approx. 50 nights per year. Since 2012: several nights as Co-I.
- The *2.5 m Nordic Optical Telescope (NOT)* with high resolution spectroscopy, 2008B: 5n (Co-I), 2009A: 5n (Co-I), 2009B: 10n (PI), Cycle 41: 5n (PI), Cycle 42: 10n (PI), Cycle 43: 7n (CoI), Cycle 44: 15n (CoI), Cycle 45: 4n (CoI), Cycle 46: 4n (CoI), Cycle 47: 4n (CoI), Cycle 48: 4n (CoI).

**Languages:**

Fluent in English and Hungarian. Basic knowledge of German. Passive knowledge of Russian.

**Miscellaneous:**

Refereeing service for AJ, ApJ, A&A and MNRAS.

SOC and LOC member on a number of international conferences.

NSF review panel

89 papers in refereed journals, 15 as first author, 34 as second author, total number of citations 3333, h-index = 34.

Led the teams discovering 55 planets around stars other than the Sun.