Curriculum Vitae - Christoph Baranec

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Professional Preparation

California Institute of Technology	CA	Astronomy	B.S., 2001
University of Arizona	AZ	Optical Sciences	Ph. D., 2007

Appointments

2015-Present	Adjunct Assistant Professor, University of Hawai‘i at Hilo
2013-Present	Assistant Astronomer (tenure-track) at the University of Hawai‘i at Mānoa
2007-2013	Postdoctoral Scholar in Astronomy at the California Institute of Technology
2002-2007	Graduate Student in Optical Sciences at the University of Arizona
2001-2002	Associate Research Engineer at the California Institute of Technology

Awards

2014 - 2016	Alfred P. Sloan Research Fellowship
2017	University of Hawaii Board of Regents’ Excellence in Research Award

Grants

Total competitive amount awarded to date: $1,874,983

Principal Investigator (PI) for the Robo-AO adaptive optics and science system. (NSF grant AST-0906060: $576,782; IUCAA collaborator funds: $615,000; gift funding from Samuel Oschin: $100,000)

PI for "Research on Astrometric Error Sources in HgCdTe Arrays." (Office of Naval Research/DURIP grant N00014-11-1-0903: $208,525)

PI for "A near-infrared science and tip-tilt camera for Robo-AO." (NSF grant AST-1207891: $261,921)

PI for "Automation and initial science demonstration of the Robo-AO laser guide star and science system." (Mt. Cuba Astronomical Foundation: $99,306)

PI for the real-time software development sub-award of Pomona College’s Table mountain adaptive optics system. (NSF grant AST-0960343: $100,000)

PI for "Extremely wide-field adaptive optics for precision astronomy of exoplanets." (Mt. Cuba Astronomical Foundation: $96,400)

US-PI for "Workshop on astronomy with adaptive optics on moderate-sized telescopes" at IUCAA, Pune, India. (IUSSTF 75-2010-WS-Adaptive Optics: $38,000)

PI for "Upgrade to Keck’s interface with US Strategic Command regarding use of lasers." (W. M. Keck Observatory: $32,861)

Institutional-PI for "The Robo-AO survey of Kepler exoplanet hosts." (NASA Exoplanets Research Program NNX15AC91G: $168,161 out of $437,362 total)

"Alfred P. Sloan Research Fellowship." (Alfred P. Sloan Foundation, $50,000)

Instrument Scientist for "Science with Robo-AO at the Kitt Peak 2.1m telescope." (NOAO: Access to the Kitt Peak 2.1m telescope, $0)

Subaward PI for "Mechanical Engineering support for Robo-AO Kitt Peak." (Rohan Murty prime-grantor; Caltech sub-grantor: $64,288)

Subaward PI for "Infrared camera deployment in support of *Enriching the harvest of exoplanets*," (John Templeton Foundation prime-grantor; Caltech sub-grantor: $56,611)

PI for "An infrared avalanche photodiode array camera for Robo-AO Kitt Peak." (Mt. Cuba Astronomical Foundation: $100,000)

Subaward PI for "Robo-AO Kitt Peak observing support for *Disk Detective Follow-up Program*," (NASA Exoplanets Research Program NNX17AD64G, PI Marc Kuchner: $22,128)

Pending proposals total as PI: $961,770

PI for "A robotic laser AO facility for rapid visible/near-infrared imaging and the demonstration of hybrid techniques," (NSF-ATI: $930,970, pending)

Co-PI for "Accurate Properties of Kepler Exoplanet Host Stars using Gaia Parallaxes" (NSF-AAG, PI D. Huber: $283,033, pending)

Students

Graduate (First and second year projects are denoted as 699-1 and 699-2 respectively)

- Maxwell Service, (2013) 699-1, “Exploring diffraction effects in Shack-Hartmann wavefront sensors.”
- Dani Atkinson, (2014) 699-2, “Characterization of companions and implications for planet candidates of Kepler objects of interest.” (2017AJ....153...25A).
- Larissa Nofi, (2014) 699-1, “A measure of stellar binarity among Kepler target stars.” This project was presented as a poster at the 2015 IAU and 2015 AAS Extreme Solar Systems conferences.
- Maïssa Salama, (2015) 699-1, “Optimizing Robo-AO at Kitt Peak and Installing a New Infrared Camera.” Maïssa presented this work as a talk at 2016 SPIE Astronomical Telescopes and Instrumentation (2016SPIE.9909E..1AS). Maïssa won a competitive SPIE Optics and Photonics Education Scholarship for her work with Robo-AO.
- Maïssa Salama, (2016) 699-2, “Preparing a Large Adaptive Optics Survey Searching for Brown Dwarfs and Wide-Orbit Exoplanets with Robo-AO.” In progress.

Undergraduate Intern mentor

- Jessica Schonhut-Stasik, (2015-2017), "Robo-AO Kepler Asteroseismic Survey. I. Adaptive optics imaging of 99 asteroseismic Kepler dwarfs and subgiants," submitted to AJ (2017arXiv170107841S).

Summer Undergraduate Research Fellowship mentor

- Matthew Feldman, 2008
- Marland Sitt, 2010
- Alexander Rudy, 2010
- Ankit Arya, 2011
- Athanasios Papadopoulos, 2011
- Corinne Vassallo, 2012
- Victoria "Ashley" Villar, Minority Undergraduate Research Fellow, 2012
- Chatarin "Mee" Wong-u-railertkun, 2013

Teaching

Fall 2015 – Optics (Physics 331) at UH Hilo, (substantially revised class)

Fall 2016 – Senior Research Projects (Astronomy 494) at UH Mānoa, (new class)

Service

- UCSC ISEE Professional Development Program: Participant, 2014 and 2015. Awarded a Certificate in Inclusive Inquiry STEM Education for design and teaching work on the 'Escape from Zombieland' computing inquiry at the Akami PREP course in 2015.
- Institute for Astronomy Outreach (2013-present): Featured speaker at 7 public/outreach events ('Imiloa Mauna Kea Skies, IfA Open House, Frontiers in Astronomy Community Event, The Universe Tonight @ Maunakea Visitors' Center, HawaiiCon, Office Mauna Kea Management Weed Pull, Pacific Asian Consortium for International Business Education and Research conference) and participant in local outreach events (Journey Through the Universe, AstroDay, Hilo Robotics Competition, Waikaloa Village Winterfest, Onizuka Day, IfA Open House, Kealakehe Elementary School Science Night, Hilo Intermediate Science Fair, Panaewa Homestead Kuhio Day Celebration).
- Project reviewer: CHARA adaptive optics wavefront sensor design review, 2013; Giant Magellan Telescope adaptive optics system review, 2013.
- Organizer of the IfA-Hilo TechTalk Series (http://ifa.hawaii.edu/~baranec/tt.shtml) 2013-
- Referee: Optics Letters, Applied Optics, Optics Express, MNRAS, PASP, JATIS.
- Member of Institute for Astronomy committees:
    - Computer Advisory Committee (Addresses computing issues), 2015-
    - Faculty Advisory Committee (Advises the director on important matters), 2016-
    - Scientific Staff Screening Committee (Faculty hiring committee), 2016-

- Time Allocation Committee, 2014-2017

- Member of local committees:
  - Maunakea Laser Operators Group (MLOG), 2013-
  - UH Hilo Physics and Astronomy Faculty Search Committee, 2016

Memberships

- SPIE - The International Society for Optical Engineering (2004-lifetime; elevated to Senior Member in 2011).
- OSA - Optical Society of America (2005-lifetime).

References

Prof. Roger Angel (rangel@as.arizona.edu, 520 621 6541)

Prof. Shrinivas Kulkarni (srk@astro.caltech.edu, 626 395 4010)

Prof. Günther Hasinger (hasinger@ifa.hawaii.edu, 808 956 8566)

Dr. Michael Hart (mhart@as.arizona.edu, 520 621 8353)

Dr. Richard Dekany (rgd@astro.caltech.edu, 626 395 6798)

Bibliography

Optical Science and Technology (Refereed)

-. The performance of the Robo-AO laser guide star adaptive optics system at the Kitt Peak 2.1m Telescope
R. Jensen-Clem, D. Duev, R. Riddle, M. Salama, **C. Baranec**, N. Law & S. Kulkarni
in submission, 2017.

46. High-speed imaging and wavefront sensing with an infrared avalanche photodiode array
C. Baranec, D. Atkinson, R. Riddle, D. Hall, S. Jacobson, N. Law & M. Chun
The Astrophysical Journal, 809, 70, 2015.

45. High-efficiency autonomous laser adaptive optics
C. Baranec, R. Riddle, N. Law, A. N. Ramaprakash, S. Tendulkar, K. Hogstrom, K. Bui, M. Burse, P. Chordia, H. Das, R. Dekany, S. Kulkarni & S. Punnadi
The Astrophysical Journal Letters, 790, L8, 2014.

44. PALM-3000: Exoplanet adaptive optics for the 5-meter Hale Telescope
R. Dekany, J. Roberts, R. Burruss, A. Bouchez, T. Truong, **C. Baranec**, S. Guiwits, D. Hale, J. Angione, T. Trinh, J. Zolkower, J. C. Shelton, D. Palmer, J. Henning, E. Croner, M. Troy, D. McKenna, J. Tesch, S. Hildebrandt & J. Milburn
The Astrophysical Journal, 776, 130, 2013.

43. Bringing the Visible Universe into Focus with Robo-AO
C. Baranec, R. Riddle, N. Law, A. N. Ramaprakash, S. Tendulkar, K. Bui, M. Burse, P. Chordia, H. Das, J. Davis, R. Dekany, M. Kasliwal, S. Kulkarni, T. Morton, E. Ofek & S.

Punnadi
The Journal of Visualized Experiments, 72, e50021, 2013.

42. **A ground-layer adaptive optics system with multiple laser guide stars**
M. Hart, N. M. Milton, **C. Baranec**, K. Powell, T. Stalcup, D. McCarthy, C. Kulesa & E. Bendek
Nature, 466, 727-729, 2010.

41. **Design considerations for low-light level low-Fresnel number optical systems**
C. Baranec
Applied Optics, 48, 6259-6263, 2009.

40. **On-sky wide field adaptive optics correction using multiple laser guide stars at the MMT**
C. Baranec, M. Hart, N. M. Milton, T. Stalcup, K. Powell, M. Snyder, V. Vaitheeswaran, D. McCarthy & C. Kulesa
The Astrophysical Journal, 693, 1814-1820, 2009.

39. **Study of a MEMS-based Shack-Hartmann wavefront sensor with adjustable pupil sampling for astronomical adaptive optics**
C. Baranec & R. Dekany
Applied Optics, 47, 5155-5162, 2008.

38. **Ground-layer wavefront reconstruction from multiple natural guide stars**
C. Baranec, M. Lloyd-Hart & N. M. Milton
The Astrophysical Journal, 661, 1332-1338, 2007.

37. **Experimental results of ground-layer and tomographic wavefront reconstruction from multiple laser guide stars**
M. Lloyd-Hart, **C. Baranec**, N. M. Milton, T. Stalcup, M. Snyder & J. R. P. Angel
Optics Express, 14, 7541-7551, 2006.

36. **First tests of wavefront sensing with a constellation of laser guide beacons**
M. Lloyd-Hart, **C. Baranec**, N. M. Milton, T. Stalcup, M. Snyder, N. Putnam & J. R. P. Angel
The Astrophysical Journal, 634, 679-686, 2005.

35. **Concept for a laser guide beacon Shack-Hartmann wave-front sensor with dynamically steered subapertures**
C. Baranec, B. Bauman & M. Lloyd-Hart
Optics Letters, 30, 693-695, 2005.

Astronomy Science (Refereed; Robo-AO)

34. **Robo-AO Kepler Asteroseismic Survey. I. Adaptive optics imaging of 99 asteroseismic Kepler dwarfs and subgiants**
J. Schonhut-Stasik, **C. Baranec**, D. Huber, C. Ziegler, D. Atkinson, E. Gaidos, N. Law, R. Riddle, J. Hagelberg, N. van der Marel, and K. Hodapp
The Astronomical Journal, *in press*, 2017.

33. **Ultra Short Period Planets in K2 with companions: a double transiting system for EPIC 220674823**
E. R. Adams, B. Jackson, M. Endl, W. Cochran, P. MacQueen, D. Duev, R. Jensen-Clem, M.

Salama, C. Ziegler, **C. Baranec**, S. Kulkarni, N. Law & R. Riddle
The Astronomical Journal, 153, 82, 2017.

32. Two small planets transiting HD 3167
A. Vanderburg, A. Bieryla, D. Duev, R. Jensen-Clem, D. Latham, A. Mayo, **C. Baranec**, P. Berlind, S. Kulkarni, N. Law, M. Nieberding, R. Riddle & M. Salama
The Astrophysical Journal Letters, 829, L9, 2016.

31. Robo-AO Kepler Planetary Candidate Survey III: Adaptive Optics Imaging of 1629 Kepler Exoplanet Candidate Host Stars
C. Ziegler, N. Law, T. Morton, **C. Baranec**, R. Riddle, D. Atkinson, A. Baker, S. Roberts & D. Ciardi
The Astronomical Journal, 153, 66, 2017.

30. 197 Candidates and 104 Validated Planets in K2's First Five Fields
I. Crossfield, D. Ciardi, E. Petigura, E. Sinukoff, J. Schlieder, A. Howard, C. Beichman, H. Isaacson, C. Dressing, J. Christiansen, B. J. Fulton, S. Lépine, L. Weiss, L. Hirsch, J. Livingston, **C. Baranec**, N. Law, R. Riddle, C. Ziegler, S. Howell, E. Horch, M. Everett, J. Teske, A. Martinez, C. Obermeier, B. Benneke, N. Scott, K. Aller, B. Hansen, L. Mancini, S. Ciceri, R. Brahm, A. Jordán, H. Knutson, T. Henning, M. Bonnefoy, M. Liu, J. Crepp, J. Lothringer, P. Hinz, V. Bailey, A. Skemer & D. Defrere
The Astrophysical Journal Supplement, 226, 7, 2016.

29. Five Planets Transiting a Ninth Magnitude Star
A. Vanderburg, J. Becker, M. Kristiansen, A. Bieryla, D. Duev, R. Jensen-Clem, T. Morton, D. Latham, F. Adams, **C. Baranec**, P. Berlind, M. Calkins, G. Esquerdo, S. Kulkarni, N. Law, R. Riddle, M. Salama, A. Schmitt
The Astrophysical Journal Letters, 827, L10, 2016.

28. Probability of physical association of 104 blended companions to Kepler objects of interest using visible and near-infrared adaptive optics photometry
D. Atkinson, **C. Baranec**, C. Ziegler, N. Law, R. Riddle & T. Morton
The Astronomical Journal, 153, 25, 2016.

27. Robo-AO Kepler Planetary Candidate Survey II: Adaptive Optics Imaging of 969 Kepler Exoplanet Candidate Host Stars
C. Baranec, C. Ziegler, N. Law, T. Morton, R. Riddle, D. Atkinson, J. Schonhut & J. Crepp
The Astronomical Journal, 152, 18, 2016.

26. Eleven multi-planet systems from K2 campaigns 1 & 2 and the masses of two hot super-Earths
E. Sinukoff, A. Howard, E. Petigura, J. Schlieder, I. Crossfield, D. Ciardi, B. J. Fulton, H. Isaacson, K. Aller, **C. Baranec**, C. Beichman, B. Hansen, H. Knutson, N. Law, M. Liu & R. Riddle
The Astrophysical Journal, 827, 78, 2016.

25. Two small temperate planets transiting nearby M dwarfs in K2 campaigns 0 and 1
J. Schlieder, I. Crossfield, E. Petigura, A. Howard, K. Aller, E. Sinukoff, H. Isaacson, B. J. Fulton, D. Ciardi, M. Bonnefoy, C. Ziegler, T. Morton, S. Lépine, C. Obermeier, M. Liu, V. Bailey, **C. Baranec,** C. Beichman, D. Defrèere, T. Henning, P. Hinz, N. Law, R. Riddle & A.

Skemer
The Astrophysical Journal, 818, 87, 2016.

24. **Planet Hunters. VIII. Characterization of 41 Long-Period Exoplanet Candidates from the Kepler Archival Data**
J. Wang, D. Fischer, T. Barclay, A. Picard, B. Ma, B. Bowler, J. Schmitt, T. Boyajian, K. Jek, D. LaCourse, **C. Baranec**, R. Riddle, N. Law, C. Lintott, K. Schawinski, D. Simister, B. Grégoire, S. Babin, T. Poile, T. Jacobs, T. Jebson, M. Omohundro, H. Schwengeler, J. Sejpka, I. Terentev, R. Gagliano, J.-P. Paakkonen, H. Berge, T. Winarski, G. Green & A. Schmitt
The Astrophysical Journal, 815, 127, 2015.

23. **HII 2407: An Eclipsing Binary Revealed by K2 Observations of the Pleiades**
T. David, J. Stauffer, L. Hillenbrand, A. Cody, K. Conroy, K. Stassun, B. Pope, S. Aigrain, E. Gillen, A. Cameron, D. Barrado y Navascues, L. Rebull, H. Isaacson, G. Marcy, C. Zhang, R. Riddle, C. Ziegler, N. Law & **C. Baranec**
The Astrophysical Journal, 814, 62, 2015.

22. **KELT-8b: A highly inflated transiting hot Jupiter and a new technique for extracting high-precision radial velocities from noisy spectra**
B. J. Fulton, K. Collins, B. Gaudi, K. Stassun, J. Pepper, T. Beatty, R. Siverd, K. Penev, A. Howard, **C. Baranec**, G. Corfini, J. Eastman, J. Gregorio, N. Law, M. Lund, T. Oberst, M. Penny, R. Riddle, J. Rodriguez, D. Stevens, R. Zambelli, C. Ziegler, A. Bieryla, G. D`Ago, D. DePoy, E. Jensen, J. Kielkopf, D. Latham, M. Manner, J. Marshall, K. McLeod & P. Reed
The Astrophysical Journal, 810, 30, 2015.

21. **Planets Around Low-Mass Stars (PALMS). V. Age-Dating Low-Mass Companions to Kinematic Members and Interlopers of Young Moving Groups**
B. P. Bowler, E. Shkolnik, M. Liu, J. Schlieder, A. Mann, T. Dupuy, S. Hinkley, J. Crepp, J. Johnson, A. Howard, L. Flagg, A. Weinberger, K. Aller, K. Allers, W. Best, N. Deacon, M. Kotson, B. Montet, G. Herczeg, **C. Baranec**, R. Riddle, N. Law, E. Nielsen, Z. Wahhaj, B. Biller & T. Hayward
The Astrophysical Journal, 806, 62, 2015.

20. **Characterizing K2 planet discoveries: A super-Earth transiting the bright K-dwarf HIP 116454**
A. Vanderburg, B. Montet, J. Johnson, L. Buchhave, L. Zeng, F. Pepe, A. Cameron, D. Latham, E. Molinari, S. Udry, C. Lovis, J. Matthews, C. Cameron, N. Law, B. Bowler, R. Angus, **C. Baranec**, A. Bieryla, W. Boschin, D. Charbonneau, R. Cosentino, X. Dumusque, P. Figueira, D. Guenther, A. Harutyunyan, C. Hellier, R. Kuschnig, M. Lopez-Morales, M. Mayor, G. Micela, A. Moffat, M. Pedani, D. Phillips, G. Piotto, D. Pollacco, D. Queloz, K. Rice, R. Riddle, J. Rowe, S. Rucinski, D. Sasselov, D, Ségransan, A. Sozzetti, A. Szentgyorgyi, C. Watson & W. Weiss
The Astrophysical Journal, 800, 59, 2015.

19. **Know the star, know the planet. IV. A stellar companion to the host star of the eccentric exoplanet HD8673b**
L. C. Roberts, B. Mason, C. Neyman, Y. Wu, R. Riddle, C. Shelton, J. Angione, **C. Baranec**, A. Bouchez, K. Bui, R. Burruss, M. Burse, P. Chordia, E. Croner, H. Das, R. Dekany, S. Guiwits, D. Hale, J. Henning, S. Kulkarni, N. Law, D. McKenna, J. Milburn, D. Palmer, S. Punnadi, A.

Ramaprakash, J. Roberts, S. Tendulkar, T. Trinh, M. Troy, T. Truong & J. Zolkower
The Astronomical Journal, 149, 144, 2015.

18. Know the star, know the planet. III. Discovery of late-type companions to two exoplanet host stars
L. C. Roberts, A. Tokovinin, B. Mason, R. Riddle, W. Hartkopf, N. Law & **C. Baranec**
The Astronomical Journal, 149, 118, 2015.

17. Characterizing the Cool KOIs. VII. Refined physical properties of the eclipsing brown dwarf LHS6343C
B. Montet, J. Johnson, P. Muirhead, A. Villar, C. Vassallo, **C. Baranec**, N. Law, R. Riddle, G. Marcy, A. Howard & H. Isaacson
The Astrophysical Journal, 800, 134, 2015.

16. Multiplicity of the Galactic Senior Citizens: A high-resolution search for cool subdwarf companions
C. Ziegler, N. M. Law, **C. Baranec**, R. Riddle & J. Fuchs
The Astrophysical Journal, 804, 30, 2015.

15. An ancient extrasolar system with five sub-Earth-size planets
T. Campante, T. Barclay, J. Swift, D. Huber, V. Adibekyan, W. Cochran, C. J. Burke, H. Isaacson, E. Quintana, G. Davies, V. Aguirre, D. Ragozzine, R. Riddle, **C. Baranec**, S. Basu, W. Chaplin, J. Christensen-Dalsgaard, T. Metcalfe, T. Bedding, R. Handberg, D. Stello, J. Brewer, S. Hekker, C. Karoff, R. Kolbl, N. Law, M. Lundkvist, A. Miglio, J. Rowe, N. Santos, C. Van Laerhoven, T. Arentoft, Y. Elsworth, D. Fischer, S. Kawaler, H. Kjeldsen, M. Lund, G. Marcy, S. Sousa, A. Sozzetti & T. R. White
The Astrophysical Journal, 799, 170, 2015.

14. The Near-Ultraviolet Luminosity Function of Young, Early M-Dwarf Stars
M. Ansdell, E. Gaidos, A. Mann, S. Lépine, D. James, A. Buccino, **C. Baranec**, N. Law, R. Riddle, P. Mauas & R. Petrucci
The Astrophysical Journal, 798, 41, 2015.

13. Characterization of the atmosphere of the hot Jupiter HAT-P-32Ab and the M-dwarf companion HAT-P-32B
M. Zhao, J. O'Rourke, J. Wright, H. Knutson, A. Burrows, J. Fortney, H. Ngo, B. J. Fulton, **C. Baranec**, R. Riddle, N. Law, P. Muirhead, S. Hinkley, A. Showman, J. Curtis & R. Burruss
The Astrophysical Journal, 796, 115, 2014.

12. A survey of the high order multiplicity of nearby Solar-type binary stars with Robo-AO
R. Riddle, A. Tokovinin, B. Mason, W. Hartkopf, L. Roberts, **C. Baranec**, N. Law, K. Bui, M. Burse, H. Das, R. Dekany, S. Kulkarni, S. Punnadi, A. N. Ramaprakash & S. Tendulkar
The Astrophysical Journal, 799, 4, 2015.

11. Characterizing the Cool KOIs. VI. H- and K-band Spectra of Kepler M Dwarf Planet-Candidate Hosts
P. Muirhead, J. Becker, G. Feiden, B. Rojas-Ayala, A. Vanderburg, E. Price, R. Thorp, N. Law, R. Riddle, **C. Baranec**, K. Hamren, E. Schlawin, K. Covey, J. Johnson & J. Lloyd
The Astrophysical Journal Supplement, 213, 5, 2014.

10. Robotic laser-adaptive-optics imaging of 715 *Kepler* exoplanet candidates using Robo-AO

N. Law, T. Morton, **C. Baranec**, R. Riddle, G. Ravichandran, C. Ziegler, J. Johnson, S. Tendulkar, K. Bui, M. Burse, H. Das, R. Dekany, S. Kulkarni, S. Punnadi & A. N. Ramaprakash
The Astrophysical Journal, 791, 35, 2014.

9. Characterizing the Cool KOIs. V. KOI-256: A Mutually Eclipsing Post-common Envelope Binary
P. Muirhead, A. Vanderburg, A. Shporer, J. Becker, J. Swift, J. Lloyd, J. Fuller, M. Zhao, S. Hinkley, J. S. Pineda, M. Bottom, A. Howard, K. von Braun, T. Boyajian, N. Law, **C. Baranec**, R. Riddle, A. N. Ramaprakash, S. Tendulkar, K. Bui, M. Burse, P. Chordia, H. Das, R. Dekany, S, Punnadi & J. A. Johnson
The Astrophysical Journal, 767, 111, 2013.

8. Millions of Multiples: Detecting and Characterizing Close-Separation Binary Systems in Synoptic Sky Surveys
E. Terziev, N. Law, I. Arcavi, **C. Baranec**, J. Bloom, K. Bui, M. Burse, P. Chorida, H. Das, R. Dekany, A. Kraus, S. Kulkarni, P. Nugent, E. Ofek, S. Punnadi, A. N. Ramaprakash, R. Riddle & S. Tendulkar
The Astrophysical Journal Supplement, 206, 18, 2013.

7. Three New Eclipsing White-dwarf - M-dwarf Binaries Discovered in a Search for Transiting Planets Around M-dwarfs
N. M. Law, A. L. Kraus, R. Street, B. J. Fulton, L. A. Hillenbrand, A. Shporer, T. Lister, **C. Baranec**, J. S. Bloom, K. Bui, M. P. Burse, S. Bradley Cenko, H. K. Das, J. T. C. Davis, R. G. Dekany, A. V. Filippenko, M. M. Kasliwal, S. R. Kulkarni, P. Nugent, E. O. Ofek, D. Poznanski, R. M. Quimby, A. N. Ramaprakash, R. Riddle, J. M. Silverman, S. Sivanandam & S. Tendulkar
The Astrophysical Journal, 757, 133, 2012.

Astronomy Science (Refereed; PALM-3000)

6. Know the Star, Know the Planet. V. Characterization of the Stellar Companion to the Exoplanet Host HD 177830
L. Roberts, R. Oppenheimer, J. Crepp, **C. Baranec**, C. Beichman, D. Brenner, R. Burruss, E. Cady, S. Luszcz-Cook, R. Dekany, L. Hillenbrand, S. Hinkley, D. King, T. Lockhart, R. Nilsson, I. Parry, L. Pueyo, A. Sivaramakrishnan, R. Soummer, E. Rice, A. Veicht, G. Vasisht, C. Zhai & N. Zimmerman
The Astronomical Journal, 150, 103, 2015.

5. Reconnaissance of the HR 8799 Exosolar System II: Astrometry and Orbital Motion
L. Pueyo, R. Soummer, J. Hoffmann, R. Oppenheimer, J. R. Graham, N. Zimmerman, C. Zhai, J. K. Wallace, F. Vescelus, A. Veicht, G. Vasisht, T. Truong, A. Sivaramakrishnan, M. Shao, L. C. Roberts Jr., J. E. Roberts, E. Rice, I. R. Parry, R. Nilsson, S. Luszcz-Cook, T. Lockhart, E. R. Ligon, D. King, S. Hinkley, L. Hillenbrand, D. Hale, R. Dekany, J. R. Crepp, E. Cady, R. Burruss, D. Brenner, C. Beichman & **C. Baranec**
The Astrophysical Journal, 803, 31, 2015.

4. The Kappa Andromedae System: New Constraints on the Companion Mass, System Age & Further Multiplicity
S. Hinkley, L. Pueyo, J. Faherty, B. Oppenheimer, E. Mamajek, A. Kraus, E. Rice, M. Ireland, T. David, L. Hillenbrand, G. Vasisht, E. Cady, D. Brenner, A. Veicht, R. Nilsson, N. Zimmerman, I. Parry, C. Beichman, R. Dekany, J. Roberts, L. Roberts, **C. Baranec**, J. Crepp, R. Burruss, K.

Wallace, D. King, C. Zhai, T. Lockhart, M. Shao, R. Soummer, A. Sivaramakrishnan & L. Wilson
The Astrophysical Journal, 779, 153, 2013.

3. Reconnaissance of the HR8799 Exosolar System I: Near IR Spectroscopy
B. Oppenheimer, **C. Baranec**, C. Beichman, D. Brenner, R. Burruss, E. Cady, J. Crepp, R. Dekany, R. Fergus, D. Hale, L. Hillenbrand, S. Hinkley, D. Hogg, D. King, E. Ligon, T. Lockhart, R. Nilsson, I. Parry, L. Pueyo, E. Rice, J. Roberts, L. Roberts, M. Shao, A. Sivaramakrishnan, R. Soummer, G. Vasisht, F. Vescelus, K. Wallace, C. Zhai & N. Zimmerman
The Astrophysical Journal, 768, 24, 2013.

Astronomy Science (Refereed; Keck AO)

2. KIC 4150611: a rare multi-eclipsing quintuple with a hybrid pulsator
K. G. Hełminiak, N. Ikita, E. Kambe, S. K. Kozłowski, R. Pawłaszek, H. Maehara, **C. Baranec** & M. Konacki, Astronomy and Astrophysics, in press, 2017.

1. Record-breaking storm activity on Uranus in 2014
I. de Pater, L. A. Sromovsky, P. M. Fry, H. B. Hammel, **C. Baranec** & K. Sayangi, Icarus, 252, 121, 2015.

Conference Proceedings

50. The Rapid Transient Surveyor
C. Baranec, J. Lu, S. Wright, J. Tonry, R. B. Tully, I. Szapudi, M. Takamiya, L. Hunter, R. Riddle, S. Chen & M. Chun
Proc. SPIE Adaptive Optics Systems V, 9909, 9909-0F 2016.

49. Robo-AO Kitt Peak: Status of the system and optimizing the sensitivity of a sub-electron readnoise IR camera to detect low-mass companions
M. Salama, **C. Baranec**, R. Jensen-Clem, R. Riddle, D. Duev, S. Kulkarni & N. Law
Proc. SPIE Adaptive Optics Systems V, 9909, 9909-1A 2016.

48. `imaka - ground-layer adaptive optics system on Maunakea
M. Chun, O. Lai, D. Toomey, J. Lu, M. Service, **C. Baranec**, S. Thibault, D. Brousseau, Y. Hayano, S. Oya, S. Santi, C. Kingery, K. Loss, J. Gardiner & B. Steele
Proc. SPIE Adaptive Optics Systems V, 9909, 9909-02 2016.

47. The Robo-AO KOI Survey: laser adaptive optics imaging of every Kepler exoplanet candidate
C. Ziegler, N. Law, **C. Baranec**, T. Morton, R. Riddle, D. Atkinson & L. Nofi
Proc. SPIE Adaptive Optics Systems V, 9909, 9909-5U, 2016.

46. Investigation of Cyclic O–C Changes in a Sample of Eclipsing Binaries
D. Jableka, S. Zola, R. Riddle, **C. Baranec** & N. Law
Astronomical Society of the Pacific Conference Series, 496, 281, 2015.

45. KOI-3158: The oldest known system of terrestrial-size planets
T. Campante, T. Barclay, J. Swift, D. Huber, V. Adibekyan, W. Cochran, C. J. Burke, H. Isaacson, E. Quintana, G. Davies, V. Aguirre, D. Ragozzine, R. Riddle, **C. Baranec**, S. Basu, W. Chaplin, J. Christensen-Dalsgaard, T. Metcalfe, T. Bedding, R. Handberg, D. Stello, J. Brewer, S. Hekker, C. Karoff, R. Kolbl, N. Law, M. Lundkvist, A. Miglio, J. Rowe, N. Santos, C. Van Laerhoven, T. Arentoft, Y. Elsworth, D. Fischer, S. Kawaler, H. Kjeldsen, M. Lund, G. Marcy,

S. Sousa, A. Sozzetti & T. R. White
Proceedings of the 3rd CoRoT Symposium, Kepler KASC7 joint meeting, 2015.

44. Robo-AO: Initial results from the first autonomous laser guide star adaptive optics instrument
R. Riddle, **C. Baranec**, N. M. Law, A. N. Ramaprakash, S. Tendulkar, K. Hogstrom, K. Bui, M. Burse, P. Chordia, H. Das, R. Dekany, S. Kulkarni, S. Punnadi & R. Smith
Revista Mexicana de Astronomía y Astrofísica (Serie de Conferencias), 45, 3, 2014.

43. PULSE: The Palomar Ultraviolet Laser for the Study of Exoplanets
C. Baranec, R. Dekany, R. Burruss, B. Bowler, M. van Dam, R. Riddle, C. Shelton, T. Truong, J. Roberts, J. Milburn & J. Tesch
Proc. SPIE Adaptive Optics Systems IV, eds. E. Marchetti, J.-P. Veran & L. Close, 9148, 2014.

42. Second generation Robo-AO instruments and systems
C. Baranec, R. Riddle, N. M. Law, M. Chun, J. Lu, M. Connelley, D. Hall, D. Atkinson & S. Jacobson
ibid.

41. Twelve-thousand laser-AO observations: first results from the Robo-AO large surveys
N. M. Law, **C. Baranec** & R. Riddle
ibid.

40. KAPAO First Light: the design, construction and operation of a low-cost natural guide star adaptive optics system
S. Severson, P. Choi, K. Badham, D. Bolger, D Contreras, B. Gilbreth, C. Guerrero, E. Littleton, J. Long, L. McGonigle, W. Morrison, F. Ortega, A. Rudy, J. Wong, E. Spjut, **C. Baranec** & R. Riddle
ibid.

39. 'imaka: a path-finder ground-layer adaptive optics system for the University of Hawaii 2.2-meter telescope on Maunakea
M. Chun, O. Lai, D. Toomey, J. Lu, **C. Baranec**, S. Thibault, D. Brousseau, H. Zhang, Y. Hayano & S. Oya
ibid.

38. Extremely high-resolution ground-layer optical turbulence profiles at Maunakea
M. Chun, O. Lai, T. Butterly, S. Goebel, D. Toomey & **C. Baranec**
ibid.

37. The Robo-AO automated intelligent queue system
R. Riddle, K. Hogstrom, A. Papadopoulos, **C. Baranec** & N. M. Law
Proc. SPIE Software and Cyberinfrastructure for Astronomy III, eds. G. Chiozzi & N. Radziwill, 9152, 2014.

36. Observatory Deployment and Characterization of SAPHIRA HgCdTe APD Arrays
D. Atkinson, D. Hall, **C. Baranec**, I. Baker, S. Jacobson & R. Riddle
Proc. SPIE High Energy, Optical, and Infrared Detectors for Astronomy VI, eds. A. Holland & J. Beletic, 9154, 2014.

35. Robo-AO: Initial results from the first autonomous laser guide star adaptive optics instrument

R. Riddle, **C. Baranec**, N. Law, A. N. Ramaprakash, S. Tendulkar, K. Hogstrom, K. Bui, M. Burse, P. Chordia, H. Das, R. Dekany, S. Kulkarni, S. Punnadi & R. Smith
Contributions of the Astronomical Observatory Skalnaté Pleso, 43, 190-199, 2014.

34. Debris Disk Science with the Palomar ExAO System: First Results
M. Wahl, S. Metchev, R. Patel, E. Serabyn, D. Mawet, R. Dekany, J. Roberts, R. Burruss, A Bouchez, T. Truong, **C. Baranec**, S. Guiwits, D. Hale, J. Angione, T. Trinh, J. Zolkower, C. Shelton, D. Palmer, J. Henning, E. Croner, M. Troy, D. McKenna & J. Tesch
Proc. IAU, 8, 72-73, 2014.

33. PULSE: Palomar Ultraviolet Laser for the Study of Exoplanets
C. Baranec, R. Dekany, M. van Dam & R. Burruss
Proc. AMOS Technologies Conference, 2013.

32. Rise of the machines: first year operations of the Robo-AO visible-light laser-adaptive optics instrument
C. Baranec, R. Riddle, N. Law, A. N. Ramaprakash, S. Tendulkar, K. Hogstrom, K. Bui, M. Burse, P. Chordia, H. Das, R. Dekany, S. Kulkarni, S. Punnadi & R. Smith
ibid.

31. Robotic visible-light laser adaptive optics
C. Baranec, R. Riddle, N. Law, A. N. Ramaprakash, S. Tendulkar, K. Bui, M. Burse, P. Chordia, H. Das, R. Dekany, S. Kulkarni & S. Punnadi
AO4ELT3, 13321, 2013.

30. PULSE: Palomar Ultraviolet Laser for the Study of Exoplanets
R. Dekany, **C. Baranec**, M. van Dam & R. Burruss
AO4ELT3, 13275, 2013.

29. First exoplanet and disk results with the PALM-3000 adaptive optics system
R. Dekany, R. Burruss, C. Shelton, B. Oppenheimer, G. Vasisht, S. Metchev, J. Roberts, J. Tesch, T. Truong, J. Milburn, D. Hale, **C. Baranec**, S. Hildebrandt, M. Wahl, C. Beichman, L. Hillenbrand, R. Patel, S. Hinkley, E. Cady & I. Parry
AO4ELT3, 13289, 2013.

28. Electric field conjugation with the project 1640 coronagraph
E. Cady, **C. Baranec**, C. Beichman, D. Brenner, R. Burruss, J. Crepp, R. Dekany, D. Hale, L. Hillenbrand, S. Hinkley, D. King, T. Lockhart, B. Oppenheimer, I. Parry, L. Pueyo, E. Rice, L. Roberts, J. Roberts, M. Shao, A. Sivaramakrishnan, R. Soummer, T. Truong, G. Vasisht, F. Vescelus, K. Wallace, C. Zhai & N. Zimmerman
Proc. SPIE Techniques and Instrumentation for Detection of Exoplanets VI, ed. S. Shaklan, 8864, 2013.

27. KAPAO: a MEMS-based natural guide star adaptive optics system
S. Severson, P. Choi, D. Contreras, B. Gilbreth, E. Littleton, L. McGonigle, W. Morrison, A. Rudy, J. Wong, A. Xue, E. Spjut, **C. Baranec** & R. Riddle
Proc. SPIE MEMS Adaptive Optics VII, eds. S. Olivier, T. Bifano & J. Kubby, 8617, 2013.

26. Robo-AO: autonomous and replicable laser-adaptive-optics and science system
C. Baranec, R. Riddle, A. N. Ramaprakash, N. Law, S. Tendulkar, S. Kulkarni, R. Dekany, K. Bui, J. Davis, M. Burse, H. Das, S. Hildebrandt & R. Smith

Proc. SPIE Adaptive Optics Systems III, eds. B. Ellerbroek, E. Marchetti & J-P. Véran, 8447, 2012.

25. The Robo-AO software: autonomous operation of a laser guide star adaptive optics system
R. Riddle, M. Burse, S. Tendulkar, **C. Baranec**, A. N. Ramaprakash, N. Law, R. Dekany, A. Rudy, M. Sitt, A. Arya & A. Papadopoulos
ibid.

24. Results from the PALM-3000 high-order adaptive optics system
J. Roberts, R. Dekany, R. Burruss, **C. Baranec**, A. Bouchez, E. Croner, S. Guiwits, D. Hale, J. Henning, D. Palmer, M. Troy, T. Truong & J. Zolkower
ibid.

23. Robo-AO: An Autonomous Laser Adaptive Optics and Science System
C. Baranec, R. Riddle, A. N. Ramaprakash, N. Law, S. Tendulkar, S. Kulkarni, R. Dekany, K. Bui, J. Davis, J. Zolkower, J. Fucik, M. Burse, H. Das, P. Chordia, M. Kasliwal, E. Ofek, T. Morton & J. Johnson
OSA Conference on Adaptive Optics: Methods, Analysis and Applications, ed. J. Christou & D. Miller, Toronto, 2011.

22. Status of the PALM-3000 high-order adaptive optics system
A. Bouchez, R. Dekany, J. Roberts, J. Angione, **C. Baranec**, K. Bui, R. Burruss, E. Croner, S. Guiwits, D. Hale, J. Henning, D. Palmer, J. C. Shelton, M. Troy, T. Truong, J. K. Wallace & J. Zolkower
Proc. SPIE Adaptive Optics Systems II, eds. B. Ellerbroek, M. Hart, N. Hubin & P. Wizinowich, 7736-61, 2010.

21. Status of the PALM-3000 high-order adaptive optics system
A. Bouchez, R. Dekany, J. Angione, **C. Baranec**, K. Bui, R. Burruss, J. Crepp, E. Croner, J. Cromer, S. Guiwits, D. Hale. J. Henning, D. Palmer, J. Roberts, M. Troy, T. Truong & J. Zolkower
Proc. SPIE Astronomical Adaptive Optics Systems and Applications IV, eds. R. Tyson & M. Hart, 7439B, 2009.

20. Wide-field astronomical image compensation with multiple laser-guided adaptive optics
M. Hart, M. Milton, **C. Baranec**, T. Stalcup, K. Powell, E. Bendek, D. McCarthy & C. Kulesa
Proc. SPIE Adaptive Coded Aperture Imaging Non-Imaging, and Unconventional Imaging Sensor Systems, eds. S. Rogers, D. P. Casasent, J. J. Dolne, T. J. Karr & V. L. Gamiz, 7468, 2009.

19. Wide-field image compensation with multiple laser guide stars
M. Hart, M. Milton, K. Powell, **C. Baranec,** T. Stalcup, E. Bendek, D. McCarthy & C. Kulesa
Proc. AMOS Technologies Conference, 2009.

18. High-order wavefront sensing system for PALM-3000
C. Baranec
Proc. SPIE Adaptive Optics Systems, eds. N. Hubin, C. Max & P. Wizinowich, 7015, 2008.

17. The PALM-3000 high-order adaptive optics system for Palomar Observatory
A. Bouchez, R. Dekany, J. Angione, **C. Baranec**, M. Britton, K. Bui, R. Burruss, J. Cromer, S. Guiwits, J. Henning, J. Hickey, D. McKenna, A. Moore, J. Roberts, T. Trinh, R. Tripathi, M.

Troy, Tuan N. Truong & V. Velur
ibid.

16. Commissioning the MMT ground-layer and laser tomography adaptive optics systems
M. Milton, M. Hart, **C. Baranec**, T. Stalcup, V. Vaitheeswaran, D. McCarthy & R. Angel
ibid.

15. Ground-Layer Adaptive Optics with Multiple Laser Guide Stars
M. Hart, N. M. Milton, **C. Baranec**, T. Stalcup, K. Powell & K. Hege
Proc. AMOS Technologies Conference, 2008.

14. Astronomical imaging using ground-layer adaptive optics
C. Baranec, M. Lloyd-Hart, M. Milton, T. Stalcup, M. Snyder, V. Vaitheeswaran, D. McCarthy & R. Angel
Proc. SPIE Astronomical Adaptive Optics Systems and Applications III, eds. R. Tyson & M. Lloyd-Hart, 6691, 2007.

13. Loki: a ground-layer adaptive optics high-resolution near-infrared survey camera
C. Baranec, M. Lloyd-Hart & M. Meyer
ibid.

12. Real-time atmospheric turbulence profile estimation using modal covariance measurements from multiple guide stars
M. Milton, M. Lloyd-Hart, J. Bernier & **C. Baranec**
ibid.

11. Closed-loop results from the MMT's multi-laser guide star adaptive optics system
M. Lloyd-Hart, **C. Baranec**, N. M. Milton & T. Stalcup
Proc. AMOS Technologies Conference, ed. S. Ryan, Wailea, E66-E74, 2007.

10. Adaptive optics using multiple guide stars
C. Baranec, M. Lloyd-Hart, M. Milton, T. Stalcup, M. Snyder & R. Angel
Symposium on Seeing, Kona, 2007.

9. Tomographic reconstruction of stellar wavefronts from multiple laser guide stars
C. Baranec, M. Lloyd-Hart, M. Milton, T. Stalcup, M. Snyder & R. Angel
Proc. SPIE Advancements in Adaptive Optics II, ed. B. Ellerbroek & D. Bonaccini, 6272, 2006.

8. Scientific goals for the MMT's multi-laser-guided adaptive optics
M. Lloyd-Hart, T. Stalcup, **C. Baranec**, M. Milton, M. Rademacher, M. Snyder, M. Meyer & D Eisenstein
ibid.

7. Tomographic reconstruction of stellar wavefronts from multiple laser guide stars
C. Baranec, M. Lloyd-Hart, M. Milton, T. Stalcup, M. Snyder & R. Angel
MMTO Science Symposium, Tucson, 2006.

6. Ground layer wavefront reconstruction using dynamically refocused Rayleigh laser beacons
C. Baranec, M. Lloyd-Hart, M. Milton, T. Stalcup, M. Snyder, N. Putnam & R. Angel
OSA Conference on Adaptive Optics: Analysis and Methods, ed. B. Ellerbroek, Charlotte, 2005.

5. Development of multi-laser guide star adaptive optics for extremely large telescopes
M. Lloyd-Hart, R. Angel, **C. Baranec**, T. Stalcup, M. Milton, M. Snyder & N. Putnam
ibid.

4. Tests at the MMT of Multi-Laser Guide Star Wavefront Sensing for Advanced Adaptive Optics
M. Lloyd-Hart, **C. Baranec**, N. M. Milton, T. Stalcup, M. Snyder, N. Putnam & R. Angel
Proc. AMOS Technologies Conference, 2005.

3. Progress towards tomographic wavefront reconstruction using dynamically refocused Rayleigh laser beacons
C. Baranec, M. Lloyd-Hart, M. Milton, T. Stalcup, J. Georges, M. Snyder, N. Putnam & R. Angel
Proc. SPIE Advancements in Adaptive Optics, ed. D. Bonaccini, B. Ellerbroek & R. Ragazzoni, 5490, 1129-1137, 2004.

2. Field tests of wavefront sensing with multiple Rayleigh laser guide stars and dynamic refocus
T. Stalcup, J. Georges, M. Snyder, **C. Baranec**, N. Putnam, M. Milton, R. Angel & M. Lloyd-Hart
ibid, 1021-1032.

1. Sky demonstration of potential for ground layer adaptive optics correction
C. Baranec, M. Lloyd-Hart, J. Codona & M. Milton
Proc. SPIE Astronomical Adaptive Optics Systems and Applications, ed. Robert K. Tyson & M. Lloyd-Hart, 5169, 341-348, 2003.

White Papers

Keck Planet Imager and Characterizer
D. Mawet, B. Bowler, R. Dekany, K. Wallace, G. Vasisht, E. Serabyn, P. Wizinowich, I. Crossfield, **C. Baranec**, C. Beichman, M. Fitzgerald, H. Knutson, C. Marois, B. Mennesson, A. Moore, A. Skemer, M. Troy & J. Wang
W. M. Keck Observatory White Papers, 2015.

Mapping the Dark Matter Distribution in the Local Universe with The Asteroid Terrestrial-impact Last Alert System (ATLAS) and the University of Hawai'i 2.2-m Robo-AO system
C. Baranec, J. Tonry, J. Lu & S. Wright
National Research Council O/IR Study White Papers, 2014.

Upgrade to Keck's interface with US Strategic Command regarding use of lasers
C. Baranec & R. Riddle
W. M. Keck Observatory White Papers, 2014.

Robotic adaptive optics facilities for 2-m class telescopes
C. Baranec
Astro2010: The Astronomy and Astrophysics Decadal Survey Supplement, 2012.

Deployment of low-cost replicable laser adaptive optics on 1-3 meter class telescopes
C. Baranec, R. Dekany, S. Kulkarni, N. Law, E. Ofek, M. Kasliwal & V. Velur
Astro2010: The Astronomy and Astrophysics Decadal Survey, 2009.

Planets Around M-dwarfs - Astrometric Detection and Orbit Characterization
N. Law, S. Kulkarni, R. Dekany & **C. Baranec**
ibid.

Patents

Compact Laser Projection Systems and Methods
C. Baranec & R. Riddle
US Patent no. 9,279,977, March 8th, 2016.

Laser Beam Guidance Systems and Methods
R. Riddle & **C. Baranec**
US Patent no. 9,405,115, August 2nd, 2016.

Systems and Methods for Modularized Control of Robotic Adaptive Optics and Laser Systems
R. Riddle & **C. Baranec**
US Patent no. 9,563,053, February 7th, 2017.

Selected Colloquia/Invited Talks

NOAO/Steward Observatory Joint Colloquium, Tucson, AZ, April 21st, 2016.
Future AO for the VLT, ESO HQ, Garching, Germany, September 16th, 2015.
Canada-France-Hawai`i Telescope Headquarters, Waimea, HI, April 30th, 2015.
UCSB Astrophysics Seminar, Santa Barbara, CA, May 21st, 2014.
Yale Astronomy Colloquium, New Haven, CT, April 17th, 2014.
Boston University Astrophysics Colloquium, Boston, MA, April 16th, 2014.
Caltech Astronomy Colloquium, Pasadena, CA, December 4th, 2013.
UCLA Astrophysics Colloquium, Los Angeles, CA, November 13th, 2013.
Keck Observatory Headquarters, Waimea, HI, September 26th, 2013.
Rochester Institute of Technology, Physics and Center for Detectors Colloquium, Rochester, NY, April 30th, 2013.
Institute for Astronomy Colloquium, Mānoa, HI, September 24th, 2012.
Carnegie Institution for Science, Pasadena, CA, September 21st, 2012.
Las Cumbres Observatory Global Telescope Network Science Seminar, Goleta, CA, September 20th, 2012.
Naval Postgraduate School, Monterey, CA, July 20th, 2012.