

# Veselin B. Kostov

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## APPOINTMENTS

### **Research Scientist**

SETI Institute/NASA Goddard Space Flight Center (Jan 2018 - present)

### **Visiting Scientist**

Johns Hopkins University (Sep 2015 - present)

### **NASA NPP Fellow**

NASA Goddard Space Flight Center (Sep 2015 - Dec 2017)

### **McLean Postdoctoral Fellow**

University of Toronto (Sep 2014 - Aug 2015)

## EDUCATION

### ***Ph.D.*, Astrophysics**

Johns Hopkins University, Dept. of Physics and Astronomy, 2014

### ***M.Phil.*, Geophysics**

Columbia University, Lamont-Doherty Earth Observatory, 2007

### ***M.S.*, Astrophysics**

University of Oklahoma, Dept. of Physics and Astronomy, 2005

### ***BS*, Physics**

Sofia University, 2002

## RESEARCH INTERESTS

**Extrasolar planets**—detection and characterization of circumbinary planets, and of planets orbiting post-common envelope binary stars; photometric and spectroscopic variability of directly-imaged giant planets

## GRANTS & FELLOWSHIPS

**NASA NPP Fellowship**, Goddard Space Flight Center, 2015-2018 (\$250K)

**McLean Postdoctoral Fellowship**, University of Toronto, 2014-2015

**NASA Earth and Space Science Fellowship**, 2013-2016 (\$100K)

**Kepler Guest Observer** Cycle 5 (approved, funding postponed), Science PI

**Graduate Foundation Fellow**, University of Oklahoma, 2002-2005

## TEACHING & SUPERVISING

### **PhD Thesis Mentor**

Lisa Esteves, University of Toronto, 2015-present

### **Master Thesis Advisor**

Keavin Moore, York University, 2015-2017 (thesis defended 2017)

### **Graduate Assistant,**

Johns Hopkins University, Baltimore 2009-2014

### **Summer project supervisor**

Alexander De la Vega; Johns Hopkins University, 2013 (now PhD student at Johns Hopkins University)

**Summer project supervisor**

Gabriella Hodosán; Space Telescope Science Institute, 2012 (now PhD student at University of St Andrews)

**Teaching Assistant**, Johns Hopkins University, Baltimore 2008-2009

**Teaching Assistant**, Columbia University, New York 2005-2007

**Graduate Assistant**, University of Oklahoma, Norman 2002- 2005

LARGE  
COLLABORATION  
PROJECTS

**Kepler Mission** - Member of the Kepler Eclipsing Binary Stars working group

**TESS Mission** - Co-organizer of the TESS Circumbinary Planets working group

**TESS Mission** - Member of the Target Selection working group

**NASA Habitable Worlds Program** (2018-2020) - Collaborator

SUCCESSFUL  
TELESCOPE  
PROPOSAL

**VLT/SPHERE**, 2018, Title - “Tatooine Reborn: Testing the Second- and Mixed-generation Planet Formation Paradigm”, **PI: V. Kostov**

**VLT/SPHERE**, 2015-2018 - Title: “VIBES: the VIsual Binary Exoplanet survey with Sphere”, PI: S. Daemgen (Co-I: V. Kostov)

**HARPS-N**, 2016, Title - “Confirming non-transiting Kepler planet candidates using HARPS-N radial velocity measurements”, PI: E. de Mooij (Co-I: V. Kostov)

**VLT/SPHERE**, 2014 – Title: “High-contrast Detection and Confirmation of a Circumbinary Substellar Companion Candidate”, **PI: V. Kostov**

**WIYN/WHIRC**, 2013 - Title: “Photometric Follow-up of a Newly Discovered Circumbinary Planet”, **PI: V. Kostov**

**APO/DIS**, 2012 - Title: “Radial Velocities of an Eclipsing Binary System from the Kepler Mission target list”, **PI: V. Kostov**

**VLT/NACO**, 2009-2010 -Title: “Follow-up Observations of Very Low-mass Companion Candidates around Nearby Stars”, **PI: V. Kostov**

OBSERVING  
EXPERIENCE

**VLT/NACO**: Infrared Adaptive Optics Imaging, 2 nights (PI: D. Apai)

**APO/DIS**: Optical Spectroscopy, 3 nights (PI: V. Kostov), 5+ nights (PI: A. Riess)

**APO/NICFPS**: Infrared Imaging, 1 night (PI: V. Kostov)

**WIYN/WHIRC**: Infrared Imaging, 1 night (PI: V. Kostov)

**Data Reduction**: IDL, Python, IRAF, PyRAF, MatLab, LaTeX, Bash/Shell, DAOPHOT

TALKS &  
PRESENTATIONS

**Talk** (Invited): *Planets with two Suns*, Carnegie DTM, Astronomy Seminar, Oct 2017

**Talk** (Contributed): *Tatooine’s Future*, Aspen Winter Conference, Aspen, Apr 2017

**Talk** (Contributed): *Tatooine’s Future*, Planetary Systems Beyond the Main Sequence II Conference, Technion University, Haifa, Israel, Mar 2017

**Talk** (Invited): *Planets with two Suns*, George Mason University, Sep 2016

**Talk** (Contributed): *Planets with two Suns*, Exoplanet Seminar, NASA GSFC, Feb 2016

**Talk** (Contributed): *KOI-2939: the largest and longest period Kepler transiting circumbinary planet*, Extreme Solar Systems III Conference, Waikoloa, HI, Dec, 2015

**Colloquium** (Invited): *Planets with two Suns*, STScI, Nov, 2015

**Seminar** (Invited): *Circumbinary Planets: What are they?* Sofia University, July 2015

**Talk** (Contributed): *Planets with two Suns*, Paris, France, 31<sup>st</sup>, International Colloquium of the Institut d’Astrophysique de Paris, July 2015

**Colloquium** (Invited): *Circumbinary Planets – Discovery and Characterization*, San Diego State University, Department of Astronomy, Jan 2015

**Talk** (Contributed): *Discovery and characterization of circumbinary planets from Kepler*, AAS Winter Meeting #223, Washington D.C, Jan 2014

**Talk** (Contributed): *Hit and miss: a slightly misaligned circumbinary planet KIC12351927b*, Kepler Science Conference II, Ames, CA, Nov 2013

**Talk** (Invited): *Circumbinary Planets from the Kepler Catalogue*, Astronomy Seminar Hour, NOAO Tucson, Oct 2013

PEER-REVIEWED  
PUBLICATIONS  
(5 as a first author,  
2 as a second author)

*Stability Limits of Circumbinary Planets: Is There a Pile-up in the Kepler CBPs?*  
Quarles, B., Satyal, S., **Kostov, V. B.**, et al. 2018, ApJ in press

*Tatooine's Future: The Eccentric Response of Kepler Circumbinary Planets to Common-Envelope Evolution*  
**Kostov, V. B.**, Moore, K., Tamayo, et al., 2016, ApJ, 832, 2

*Kepler-1647 the largest and longest-period Kepler transiting circumbinary planet*  
**Kostov, V. B.**, Orosz, J., Welsh, W., et al., 2016, ApJ, 827, 86

*Nominal Values for Selected Solar and Planetary Quantities: IAU 2015 Resolution B3*  
Prsa, A., Harmanec, P., Torres, G. et al. (including **Kostov, V. B.**), 2016, AJ, 152, 41

*Kepler Eclipsing Binary Stars. VII. The Catalog of Eclipsing Binaries Found in the Entire Kepler Data Set*  
Kirk, B., Conroy, K., Prsa, A., et al. (including **Kostov, V. B.**), 2016, AJ, 151, 68

*Kepler Eclipsing Binary Stars. VIII. Identification of False Positive Eclipsing Binaries and Re-extraction of New Light Curves*  
Abdul-Masih, M., Prsa, A., Conroy, K., et al. (including **Kostov, V. B.**), 2016, AJ, 151, 101

*Rotation Periods of Young Brown Dwarfs: K2 Survey in Upper Scorpius*  
Scholz, A., **Kostov, V. B.**, Jayawardhana, R., Mužić, K., 2015, ApJL, 809, 2

*Kepler 453 – The 10<sup>th</sup> Kepler Transiting Circumbinary Planet*  
Welsh, W. F., Orosz, J. A., Short, D., et al. (including **Kostov, V. B.**), 2015, ApJ, 809, 26

*Predicting a third planet in the Kepler-47 circumbinary system*  
Hinse, T. C., Haghighipour, N., **Kostov, V. B.**, Gozdziewski, K., 2015, ApJ, 799, 88

*Kepler-413b: slightly misaligned, Neptune-sized circumbinary planet*  
**Kostov, V. B.**, McCullough, P. R., Carter, et al., 2014, ApJ, 784, 14

*A Gas Giant Circumbinary Planet Transiting the F Star of the Eclipsing Binary Star KIC4862625 and the Independent Discovery and Characterization of the two transiting planets in the Kepler-47 System*  
**Kostov, V. B.**, McCullough, P. R., Hinse, et al., 2013, ApJ, 770, 52

*Mapping Directly Imaged Giant Exoplanets*  
**Kostov, V. B.** & Apai, D., 2013, ApJ, 762, 47

*The Dartmouth Stellar Evolution Database*  
Dotter, A., Chaboyer, B., Jevremović, D., **Kostov, V. B.**, Baron, E., Ferguson, J.W., 2008, ApJS, 178, 1

*Probing the evolution of the dark energy density with future supernova surveys*  
Wang, Y., **Kostov, V. B.**, Freese, K., Frieman, J.A., Gondolo, P., 2004, JCAP, 12, 3

*Gas hydrates: entrance to a methane age or climate threat?* V. Krey, J. G. Canadell, N. Nakicenovic, Y. Abe, H. Andruleit, et al. (including **Kostov, V. B.**), *Environ. Res. Letters*, 2009, 4: 034007

## PUBLICITY

### **Kostov et al. 2016**

*“Planets with two suns live longer”*, *Sterne und Weltraum*, Jan, 2017

### **Kostov et al. 2016**

NASA GSFC: *“New Planet Is Largest Discovered That Orbits Two Suns”*, June 13, 2016  
Also reported by Washington Post, Guardian, CNN, and many others

### **Kostov et. al. 2014**

LA Times: *Weird Wobbly Planet? Kepler-413b may have speedy seasons*, Feb 04, 2014

Also reported by [The Telegraph](#), [Sky and Telescope](#), [National Geographic](#), [Daily Mail](#), BBC Radio, and many others

### **Kostov et. al. 2012**

Wired Magazine: *“Tatooine Times Two: Amateur Astronomers Find Planet in Four-Star System”*, Oct 10, 2012.

orbiterchspacenews.blogspot.com: *“Planet Hunters found a planet accompanied by four suns”*, Oct 16, 2012

Australian Science Education Initiative: *“Planet Hunters: The Discovery of Real Life Tatooine Planet”*, Oct 18, 2012

## OUTREACH & SERVICE

**TESS Presenter** - Intrepid Space and Science Festival, New York, 2017

**Panelist** - NASA Exoplanets Research Program, 2017

**Panelist** - NASA Earth and Space Science Fellowship, 2016

**Co-Organizer** - NASA GSFC Exoplanet Group Meetings, 2015-present

**Science Judge** - NYCSEF, New York, 2008-present (head judge 2013-present)

**Presenter** - Public talk at STScI, Baltimore, 2013

**Reviewer** - ANR Programme Blanc, 2013

**Presenter** - JHU Physics Fair, Baltimore, 2009-2012

**Organizer** - Transit of Venus Event at Johns Hopkins University, Baltimore, 2012