

# EARL BELLINGER

## Ph.D. Candidate – Theoretical Astrophysics

Max Planck Institute & Yale University

Department of Astronomy, Yale University  
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New Haven, CT  
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## EDUCATION

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- Ph.D. Astrophysics**, *International Max Planck Research School, Göttingen, Germany*  
2015–present
  - Max Planck Institute for Solar System Research
  - Department of Astronomy, Yale University
  - Institute of Computer Science, University of GöttingenFellow of the National Physical Science Consortium  
Thesis: [Forward and Inverse Problems in Asteroseismology](#)
- M.Sc. Computer Science**, *Indiana University, Bloomington, IN, USA*  
2012–2014 Fellow of the National Physical Science Consortium  
GPA: 3.94/4.0
- B.Sc. Computer Science**, *State University of New York at Oswego, USA*  
**B.Sc. Applied Mathematics**, *ibid.*  
2008–2012 Honors Thesis: [Multiphase Relations of Magellanic Cloud Cepheids](#)  
GPA: 3.81/4.0 (*summa cum laude*, ranked #1 in computer science)

## RESEARCH

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### Universities

- Yale** Department of Astronomy, Yale University, New Haven, CT, USA  
2016–present *Visiting Assistant in Research (stellar astrophysics)*
- IU** School of Informatics & Computing, Indiana University, Bloomington, IN, USA  
2013–2015 *Research Assistant (machine learning & bioinformatics)*
- UFAL** Physics Institute, Federal University of Alagoas, Maceió, Brazil  
Summer 2011 *NSF Research Student (quantum mechanics)*

### National Labs

- MPS** Max Planck Institute for Solar System Research, Göttingen, Germany  
2015–present *Research Assistant (asteroseismology)*
- NIST** National Institute of Standards and Technology, Gaithersburg, MD, USA  
Summers 2013–2014, 2017 *Guest Researcher (data mining & chemical informatics)*
- NII** National Institute of Informatics, Tokyo, Japan  
Spring 2013 *Research Student (artificial intelligence)*
- NASA** Jet Propulsion Laboratory, Pasadena, CA, USA  
Summer 2012 *Summer Undergraduate Research Fellow (Cassini mission to Saturn)*
- LNAS** National Laboratory of Astrophysics, Itajubá, Brazil  
Summer 2010 *NSF Research Student (variable stars)*

## TEACHING

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- ASTR 550** Teaching Assistant, [Stellar Astrophysics](#)  
Spring 2017 *Department of Astronomy, Yale University*
- M.Phy.55x.3C** Assistant, [Numerical Experiments in Stellar Physics](#)  
Summer 2016 *Fakultät Physik, Georg-August-Universität Göttingen*
- CSCI-C211/A591** Associate Instructor, [Introduction to Computer Science](#) (Honors section)  
Fall 2012 *School of Informatics and Computing, Indiana University*
- HON 150** Seminar Leader, [Introduction to Honors](#)  
Fall 2010 *Honors Program, SUNY Oswego*

## PUBLICATIONS

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### Journal Papers

- [\*] Angelou, G., **Bellinger, E. P.**, Hekker, S., Basu, S. (2017). On the Statistical Properties of the Lower Main Sequence. *The Astrophysical Journal*, submitted.
- [4] **Bellinger, E. P.**, Angelou, G., Hekker, S., Basu, S., Ball, W., Guggenberger, E. (2016). Fundamental Parameters of Main-Sequence Stars in an Instant with Machine Learning. *The Astrophysical Journal*, 830 (1), 20.
- [3] Guggenberger, E., Hekker, S., Basu, S., **Bellinger, E. P.** (2016). Significantly improving stellar mass and radius estimates: A new reference function for the  $\Delta\nu$  scaling relation. *Monthly Notices of the Royal Astronomical Society*, 461 (2), doi: 10.1093/mnras/stw1326.
- [2] Glover, M., **Bellinger, E. P.**, Radivojac, P., Clemmer, D. (2015). Penultimate Proline in Neuropeptides. *Analytic Chemistry*, 87 (16), 8466–8472, doi: 10.1021/acs.analchem.5b01889.
- [1] Ngeow, C. C., Kanbur, S. M., **Bellinger, E. P.**, Marconi, M., Musella, I., Cignoni, M., & Lin, Y. H. (2012). Period-luminosity relations for Cepheid variables: from mid-infrared to multi-phase. *Astrophysics and Space Science*, 341(1), 105–113, doi: 10.1007/s10509-012-1018-5.

### Conference Proceedings

- [\*] **Bellinger, E. P.**, Angelou, G., Hekker, S., Basu, S., Ball, W., Guggenberger, E. (2016). Fundamental Parameters in an Instant with Machine Learning: Application to Kepler LEGACY Targets. *Seismology of the Sun and Distant Stars 2016*, submitted.
- [\*] Hekker, S., Elsworth, Y., Basu, S., **Bellinger, E. P.** (2016). Evolutionary states of red-giant stars from grid-based modelling. *Seismology of the Sun and Distant Stars 2016*, submitted.
- [6] **Bellinger, E. P.**, Wysocki, D., Kanbur, S. M. (2015). Measuring amplitudes of harmonics and combination frequencies in variable stars. *Communications from the Konkoly Observatory of the Hungarian Academy of Sciences*, 105.
- [5] Ji, C., Li, Y. F., **Bellinger, E. P.**, Li, S., Arnold, R. J., Radivojac, P., Tang, H. (2015). A maximum-likelihood approach to absolute protein quantification in mass spectrometry. In *Proceedings of the 6th ACM Conference on Bioinformatics, Computational Biology and Health Informatics* (pp. 296–305).
- [4] **Bellinger, E. P.**, Kanbur, S. M., & Ngeow, C. C. (2012). New insights into the Cepheid PL Relation through the use of multiphase relations. *Proceedings of the 20th Stellar Pulsations Conference*.
- [3] Reyner, S., **Bellinger, E. P.**, & Kanbur, S. M. (2012). The approximation of RR Lyrae and eclipsing binary light curves using cubic polynomials. *Proceedings of the 20th Stellar Pulsations Conference*.
- [2] **Bellinger, E. P.** (2012). Multiphase Relations of Magellanic Cloud Cepheids. *Proceedings of the 2012 National Conference on Undergraduate Research*.
- [1] **Bellinger, E. P.**, Kanbur, S. M., & Ngeow, C. C. (2011). Multiphase Comparison of Period-Luminosity Relations for Magellanic Cloud Cepheids. *Proceedings of the 9th Pacific Rim Conference on Stellar Astrophysics* (Vol. 451, p. 311).

### Technical Reports

- [1] **Bellinger, E. P.**, Conner, D., Mittman, D., Magee, K., & Heventhal, B. (2012). CASSIUS: the Cassini Uplink Scheduler. *Jet Propulsion Laboratory: National Aeronautics and Space Administration*, hdl:2014/43122.

## TALKS

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### Conferences

- October 2015 **RR Lyrae 2015**  
*Resolving combination frequency amplitudes of multi-mode pulsators*  
Visegrád, Hungary
- January 2015 **American Astronomical Society**  
*Optimal Model Discovery of Periodic Variable Stars*  
Seattle, WA, USA
- March 2012 **National Conference on Undergraduate Research**  
*Multiphase Relations of Cepheid Variable Stars in the Magellanic Clouds*  
Weber State University, Ogden, UT, USA

## Workshops

- May 2016 **6th Aarhus Workshop on Red Giant Branch Modelling**  
*Stellar Parameters in an Instant with Machine Learning*  
Max-Planck-Institut für Sonnensystemforschung, Göttingen, Germany
- January 2015 **Delhi Workshop on Variable Stars**  
*Calibrating the Cepheid Distance Scale*  
Delhi, India
- January 2014 **Kerala Workshop on Stellar Astrophysics**  
*Automated Supervised Classification of Variable Stars*  
Kerala, India
- April 2013 **KUBIC-NII Joint Seminar on Bioinformatics**  
*Asynchronous Updating in 1D Cellular Automata with Stochastic Perturbations*  
Kyoto, Japan

## Public Lectures

- October 2016 **Science Today** (invited talk)  
*From Starlight to Stellar Ages: A Look Inside the Private Lives of Stars*  
Oswego, NY, USA
- April 2012 **Quest Global Laboratory**  
*Dynamics of Interacting Electrons in Disordered Systems*  
Oswego, NY, USA
- April 2012 **Quest Global Laboratory**  
*Synapsolution: Producing Prodigies of Problem Solving*  
Oswego, NY, USA

## CONFERENCE POSTERS

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- July 2016 **Joint TASC2 & KASC9 Workshop – SPACEINN & HELAS8 Conference**  
*Fundamental Parameters of Main-Sequence Stars in an Instant with Machine Learning*  
Angra do Heroísmo, Terceira-Açores, Portugal
- June 2015 **The KASC8/TASC1 Workshop**  
*GarsGen: An in-situ optimization algorithm for GARSTEC and ADIPLS stellar physics codes*  
Aarhus, Denmark
- September 2011 **20th Stellar Pulsation Conference**  
*New insights into the Cepheid PL Relation through the use of multiphase relations*  
Granada, Spain
- April 2011 **Sigma Xi Northeastern Research Symposium**  
*Multiphase Comparison of PL and PW Relations for Magellanic Cloud Cepheids*  
Stony Brook, NY, USA
- January 2011 **American Astronomical Society**  
*Multiphase Comparison of PL/PC Relations*  
Seattle, WA, USA

## MISC

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### Languages

**Natural** English, German, Portuguese, Spanish

### Machine

**Expertise** R, Python, Bash, L<sup>A</sup>T<sub>E</sub>X, HTML, CLISP, Scheme, Java, MATLAB

**Proficiency** C, Javascript, Perl, SQL, FORTRAN 77/95, CSS

**Familiarity** ActionScript, Assembly, BASIC, C++, Haskell, Mathematica, ML, PHP, Prolog, Ruby, VB

## PhD Schools

**MESA** Summer School on Stellar Evolution  
2016 *U.C. Santa Barbara, CA, USA*

**Azores** International Advanced School in Space Sciences  
2016 *Horta, Faial, Azores Islands, Portugal*

## Music

**MegaGauß** Band leader and electric bass player of 12-member ensemble  
2015–2016

**Well-Read Citizens** Composer, co-producer, instrumentalist, and vocalist on 10-track LP  
2012 “Is This The Morning When We Wake Up?” (*Tyler Hall Records*)

**The Occupants** Electric bass on 2-track EP  
2012 “The Occupied EP” (*Tyler Hall Records*)

## Volunteering

**St. Baldrick's Foundation** Helped raise over \$50,000 for research to find cures for childhood cancers.  
2010–2011 *Oswego, NY, USA*

**Easy Street Horse & Barnyard Rescue** Provided care for horses with this IRS approved 501(c)(3) family-run charitable organization.  
2006–2010 *Amsterdam, NY, USA*

## AWARDS & HONORS

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**NPSC Fellowship** National Physical Science Consortium Graduate Fellowship  
2012–2017

**Outstanding Senior** Oebele Van Dyk Outstanding Computer Science Senior Award  
2012

**Chancellor's Award** SUNY Chancellor's Award for Student Excellence  
2012

**SFCC Grant** SUNY Oswego Student/Faculty Collaborative Challenge Grant  
2012

**RBE Scholarship** Robert Brian Ellis Scholarship  
2011

**NYSFHB Scholarship** New York State Federation of Home Bureau Scholarship  
2011

**NSF REU** National Science Foundation International Research Experience for Undergraduates / SUNY Oswego Global Laboratory Scholarship (*awarded twice*)  
2010–2011

**SMART Grant** National Science and Mathematics Access to Retain Talent (SMART) Grant (*awarded twice*)  
2010–2011

**AC Grant** National Academic Competitiveness Grant (*awarded twice*)  
2008

**Presidential Scholarship** SUNY Oswego Presidential Scholarship (*awarded four times*)  
2008–2012