

# Thea Kozakis

ASTROPHYSICIST · ASTROBIOLOGIST

National Space Institute, Technical University of Denmark, Lyngby, Denmark

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*“Imagination will often carry us to worlds that never were, but without it we go nowhere.” - Carl Sagan*

## Education & Academic Positions

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### Postdoctoral Researcher

NATIONAL SPACE INSTITUTE, TECHNICAL UNIVERSITY OF DENMARK

- Postdoctoral fellowship with Exoplanet Group

Lyngby, Denmark

Sept 2020 - present

### PhD Astrophysics

CARL SAGAN INSTITUTE, CORNELL UNIVERSITY

- Advisor: Lisa Kaltenegger
- Thesis: Stellar UV Environments and Planetary Habitability Throughout Stellar Evolution

Ithaca, New York, USA

August 2020

### MS Astrophysics

CARL SAGAN INSTITUTE, CORNELL UNIVERSITY

- Funded by New York Space Grant

\*medical exemption granted from the University for the 2015-2016 academic year

Ithaca, New York, USA

May 2017\*

### BS Astrophysics, BS Physics

COLLEGE OF CHARLESTON

- Advisor: Joseph Carson
- Thesis: Directly Imaging Planets Around High-Mass Stars
- Minor: Mathematics

Charleston, South Carolina, USA

May 2013

## Areas of expertise

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impacts of stellar host spectrum on planetary composition; climate/photochemistry modeling of planetary atmospheres; simulation of transmission/reflected light/emission planetary spectra; ozone formation and destruction; habitable zone modeling; red giant planetary systems; white dwarf planetary systems; UV photometry; direct imaging of exoplanets/disks

## Publications

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**T. Kozakis**, J. M. Mendonça, L. A. Buchhave, 2022, *Is ozone a reliable proxy for molecular oxygen? I. The O2-O3 relationship for Earth-like atmospheres*, forthcoming article with A & A, doi:10.1051/0004-6361/202244164

Quanz, S. P., ... **T. Kozakis**, et al. 2022, *Large Interferometer For Exoplanets (LIFE). I. Improved exoplanet detection yield estimates for a large mid-infrared space-interferometer mission*, A & A, 664, A21

Z. Lin, S. Seager, S. Ranjan, **T. Kozakis**, & L. Kaltenegger, 2022, *H2-dominated Atmosphere as an Indicator of Second-generation Rocky White Dwarf Exoplanets*, ApJL, 925, L10

**T. Kozakis** & L. Kaltenegger, 2020, *High resolution Spectra of Earth-Like Planets Orbiting Red Giant Host Stars*, AJ, 160, 225

L. Kaltenegger, R. J. MacDonald, **T. Kozakis**, et al., 2020, *The White Dwarf Opportunity: Robust Detections of Molecules in Earth-like Exoplanet Atmospheres with the James Webb Space Telescope*, ApJL, 901, L1

**T. Kozakis**, Z. Lin, L. Kaltenegger, 2020, *Planetary Spectra and Biosignatures of Earth-like Planets Orbiting in the White Dwarf Habitable Zone*, ApJL, 894, L6

**T. Kozakis** & L. Kaltenegger, 2019, *Atmospheres and UV Environments of Earth-like Planets throughout Post-main-sequence Evolution*, ApJ, 875, 99

**T. Kozakis**, L. Kaltenegger, & D.W. Hoard, 2018, *UV Surface Environments and Atmospheres of Earth-like Planets Orbiting White Dwarfs*, *ApJ*, 862, 69

T. Boyajian, ... **T. Kozakis**, et al., 2016, *Planet Hunters X. KIC 8462852: Where's the flux?*, *MNRAS*, 457, 3988

J. Carson, C. Thalmann, M. Janson, **T. Kozakis**, et al., 2013, *Direct Imaging Discovery of a 'Super-Jupiter' Around the late B-Type Star  $\kappa$  And*, *ApJL*, 763, 32

## Academic Honors & Grants

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2019	<b>NASA New York Space Grant</b> , NASA New York Space Grant Consortium	Cornell University
2017, 2018	<b>Simons Collaboration on the Origins of Life Grant</b> , Simons Foundation	Cornell University
2016	<b>Eleanor York Prize</b> , Astronomy and Space Sciences Department	Cornell University
2015	<b>Exemplary Poster Award</b> , Emerging Researchers in Exoplanet Science Symposium	Pennsylvania State University
2013-2014	<b>NASA New York Space Grant</b> , NASA New York Space Grant Consortium	Cornell University
2014, 2015	<b>NSF Graduate Fellowship Honorable Mention</b> , National Science Foundation	Cornell University
2013	<b>Outstanding Undergraduate Research Award</b> , South Carolina Academy of Science	College of Charleston
2013	<b>Department Honors Award</b> , Department of Physics & Astronomy	College of Charleston
2013	<b>Outstanding Student Award</b> , School of Sciences and Mathematics	College of Charleston
2012	<b>Major Academic Year Support Grant</b> , School of Sciences and Mathematics	College of Charleston
2012	<b>Summer Undergraduate Research with Faculty Grant</b> , School of Sciences and Mathematics	College of Charleston
2012	<b>Goldwater Scholarship Honorable Mention</b> , Scholarship & Excellence in Education Foundation	College of Charleston

## Presentations

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<b>MPIA-APEX Exocoffee, invited talk</b>	Heidelberg, Germany (online)
IS OZONE A RELIABLE PROXY FOR MOLECULAR OXYGEN?	September 2022
<b>Latsis Origins of Life Symposium, talk</b>	Zurich, Switzerland
IS OZONE A RELIABLE PROXY FOR MOLECULAR OXYGEN?	September 2022
<b>CHAMELEON retreat, invited talk</b>	Copenhagen, Denmark
IS OZONE A RELIABLE PROXY FOR MOLECULAR OXYGEN?	September 2022
<b>Danish Annual Astronomy Meeting, talk</b>	Fredericia, Denmark
IS OZONE A RELIABLE PROXY FOR MOLECULAR OXYGEN?	May 2022
<b>Astrobiology Science Conference, talk</b>	Atlanta, Georgia, USA
IS OZONE A RELIABLE PROXY FOR MOLECULAR OXYGEN?	May 2022
<b>Exoplanets IV, poster</b>	Las Vegas, Nevada, USA
IS OZONE A RELIABLE PROXY FOR MOLECULAR OXYGEN?	May 2022
<b>Cambridge Exoplanet Seminar, invited talk</b>	Cambridge University, Cambridge, UK (online)
LIFE AFTER (STELLAR) DEATH: HABITABILITY AROUND WHITE DWARFS	June 2021
<b>Annual Danish Astronomy Meeting, talk</b>	Online
LIFE AFTER (STELLAR) DEATH: HABITABILITY AROUND WHITE DWARFS	May 2021
<b>STScI Exoplanets, Star and Planet Formation Seminar, invited talk</b>	Space Telescope Science Institute, Maryland, USA (online)
LIFE AFTER (STELLAR) DEATH: HABITABILITY AROUND WHITE DWARFS	May 2021

<b>Valparaiso University Physics &amp; Astronomy Colloquium, invited talk</b>	Valparaiso University, Valparaiso, Indiana, USA (online)
LIFE AFTER (STELLAR) DEATH: HABITABILITY AROUND WHITE DWARFS	March 2021
<b>AAS Winter Meeting, talk</b>	Online
LIFE AFTER (STELLAR) DEATH: HABITABILITY AROUND WHITE DWARFS	January 2021
<b>MIT Exoplanet Tea, invited talk</b>	MIT, Cambridge, Massachusetts, USA (online)
LIFE AFTER (STELLAR) DEATH: HABITABILITY AROUND WHITE DWARFS	October 2020
<b>Exoplanets III, talk</b>	Heidelberg, Germany (online)
LIFE AFTER (STELLAR) DEATH: ATMOSPHERES AND BIOSIGNATURES OF EARTH-LIKE PLANETS ORBITING IN THE HABITABLE ZONES OF WHITE DWARFS	July 2020
<b>AAS Winter Meeting, dissertation talk</b>	Honolulu, Hawai'i, USA
PLANETARY HABITABILITY AND BIOSIGNATURES THROUGHOUT STELLAR EVOLUTION	January 2020
<b>Extreme Solar Systems IV, poster</b>	Reykjavík, Iceland
DYING TO LIVE: POST-MAIN SEQUENCE HABITABILITY	August 2019
<b>Exoclimates V, poster</b>	University of Oxford, Oxford, UK
DYING TO LIVE: POST-MAIN SEQUENCE HABITABILITY	August 2019
<b>Astrobiology Graduate Conference, talk</b>	Salt Lake City, Utah, USA
ATMOSPHERES AND UV ENVIRONMENTS OF PLANETS THROUGHOUT POST-MAIN SEQUENCE EVOLUTION	July 2019
<b>Emerging Researchers in Exoplanet Science Symposium, talk</b>	Cornell University, Ithaca, New York, USA
ATMOSPHERES AND UV ENVIRONMENTS OF PLANETS THROUGHOUT POST-MAIN SEQUENCE EVOLUTION	June 2019
<b>AAS Winter Meeting, talk</b>	Seattle, Washington, USA
HABITABILITY OF POST-MAIN SEQUENCE PLANETARY SYSTEMS	January 2019
<b>Planetary Lunch Talk Series, talk</b>	Cornell University, Ithaca, New York, USA
LIFE AFTER (STELLAR) DEATH: HABITABILITY AROUND WHITE DWARFS	August 2018
<b>Graduate Student/Post-Doctorate Seminar, talk</b>	Cornell University, Ithaca, New York, USA
DYING TO LIVE: POST-MAIN SEQUENCE HABITABILITY	August 2018
<b>Cool Stars 20, poster</b>	Boston, Massachusetts, USA
ATMOSPHERES AND UV GROUND ENVIRONMENT FOR PLANETS ORBITING RED GIANTS	August 2018
<b>University of St Andrews, invited talk</b>	University of St Andrews, St Andrews, UK
UV SURFACE ENVIRONMENTS AND ATMOSPHERES OF EARTH-LIKE PLANETS ORBITING WHITE DWARFS	July 2018
<b>University of Edinburgh, invited talk</b>	University of Edinburgh, Edinburgh, UK
UV SURFACE ENVIRONMENTS AND ATMOSPHERES OF EARTH-LIKE PLANETS ORBITING WHITE DWARFS	July 2018
<b>Exoplanets II, poster</b>	Cambridge University, Cambridge, UK
UV SURFACE ENVIRONMENTS AND ATMOSPHERES OF EARTH-LIKE PLANETS ORBITING WHITE DWARFS	July 2018
<b>Graduate Student/Post Doctorate Seminar, talk</b>	Cornell University, Ithaca, New York, USA
DO YOU BELIEVE IN LIFE AFTER (STELLAR) DEATH?: WHITE DWARF HABITABILITY	June 2018

### **Emerging Researchers in Exoplanet Science Symposium, poster**

ATMOSPHERES AND UV GROUND ENVIRONMENT FOR PLANETS ORBITING RED GIANTS

Pennsylvania State University, State College, Pennsylvania, USA

June 2018

### **Emerging Researchers in Exoplanet Science Symposium, talk**

BIO-SIGNATURES AND UV ENVIRONMENTS OF EARTH-LIKE PLANETS ORBITING WHITE DWARFS

Pennsylvania State University, State College, Pennsylvania, USA

June 2017

### **Astrobiology Graduate Conference, talk**

BIO-SIGNATURES AND UV ENVIRONMENTS OF EARTH-LIKE PLANETS ORBITING WHITE DWARFS

Charlottesville, Virginia, USA

June 2017

### **Astrobiology Science Conference, poster**

BIO-SIGNATURES AND UV ENVIRONMENTS OF EARTH-LIKE PLANETS ORBITING WHITE DWARFS

Mesa, Arizona, USA

April 2017

### **Astrobiology Science Conference, poster**

AGE ROTATION-ACTIVITY RELATIONSHIP OF KEPLER FIELD STARS

Chicago, Illinois, USA

June 2015

### **Emerging Researchers in Exoplanet Science Symposium, poster**

AGE ROTATION-ACTIVITY RELATIONSHIP OF KEPLER FIELD STARS

Pennsylvania State University, State College, Pennsylvania, USA

May 2015

### **South Carolina Academy of Science Conference, talk**

DIRECT IMAGING DISCOVERY OF A 'SUPER-JUPITER' AROUND A LATE B-TYPE STAR

Columbia, South Carolina, USA

April 2013

### **AAS Winter Meeting, poster**

THE SUBARU SEEDS IMAGING SEARCH FOR EXOPLANETS AROUND HIGH-MASS STARS

Long Beach, California, USA

January 2013

### **AAS Winter Meeting, poster**

THE SUBARU SEEDS IMAGING SEARCH FOR EXOPLANETS AROUND HIGH-MASS STARS

Austin, TX, USA

January 2012

## **Teaching**

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### **Teaching Assistant: From New Worlds to Black Holes**

LECTURER: DR LISA KALTENEGGER

Cornell University, Ithaca, NY, USA

Fall 2015 (Head TA), 2018

- Introductory astronomy class focusing on the Universe as a whole
- Organized other TAs, managed course website, and dealt with logistical issues
- Assisted in writing and grading homework assignments and exams
- Taught recitation sections and held office hours

### **Teaching Assistant: Our Solar System**

LECTURERS: DRS STEVE SQUYRES AND PHIL NICHOLSON

Cornell University, Ithaca, NY, USA

Spring 2015

- Introductory astronomy class focusing on the Solar System
- Taught recitation sections and lab sections and held office hours
- Assisted in writing and grading homework assignments and exams

### **Teaching Assistant: A Spacecraft Tour of the Solar System: Science, Policy and Exploration**

LECTURER: DR ALEXANDER HAYES

Cornell University, Ithaca, NY, USA

Fall 2014

- Writing class focused on exploration of the Solar System
- Assisted in teaching students how to write popular science articles
- Graded written work and gave feedback and held office hours
- Managed course website

### **Teaching Assistant: Introductory Astronomy Lab**

LAB MANAGER: CHRISTOPHER TRUE

College of Charleston, SC USA

Fall 2010-Spring 2011

- Introductory astronomy class
- Assisted instructor in running labs and teaching the students
- Set up telescopes and taught students how to operate them

### **Physics Lab Manager's Assistant**

LAB MANAGER: KATHLEEN LOW

College of Charleston, SC USA

Fall 2009-Spring 2013

- Held office hours for students in introductory physics classes
- Helped prepare equipment for physics labs and assist lab instructors
- Organized lab materials and equipment

## Outreach

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### Astronomy on Tap - Copenhagen chapter

Copenhagen, Denmark

ORGANIZING TEAM/SPEAKER

2021-present

- Monthly outreach event where professional astronomers give public talks in a local pub
- Planned event themes and invited relevant speakers
- Helped facilitate/host events and ensured that speakers had proper equipment and addressing problems as they arose

### Expanding Your Horizons

Cornell University, Ithaca, NY, USA

WORKSHOP DESIGNER/ORGANIZER

2015-2020

- Yearly outreach event attended by middle school girls from New York to learn about the different STEM fields
- Part of the original astronomy workshop design team, team leader for the past 2 years
- Wrote yearly applications for event approval, recruit/train volunteers and run event

### Mental Health Counselor Training (EARS)

Ithaca, NY, USA

CERTIFIED MENTAL HEALTH COUNSELOR/TRAINER

2015-2020

- Semester long training offered by EARS (Empathy Assistance and Referral Service), a walk-in mental health counseling program
- Give presentations on empathetic listening and communication skills to Cornell students of all levels
- Small group teaching of Cornell graduate students and post doctoral researchers skills of mental health counseling

### Cornell's Ask an Astronomer

Ithaca, NY, USA

TEAM MEMBER

2013-2020

- Answered questions from the general public submitted to Cornell's Ask an Astronomer webpage
- Helped update the website with new question answers
- Recruited new team members

### Museum in the Dark

Ithaca, NY, USA

ORGANIZER

2014-2017

- Halloween-themed outreach event at a local museum with astronomy related demos
- Liaison between the museum and the astronomy department
- Recruited/trained volunteers to run science demos and obtained/organized all materials for the event

### 4-H Focus for Teens Workshop

Cornell University, Ithaca, NY, USA

ORGANIZER

2014-2017

- Summer outreach event for high school students in the New York 4-H program to attend STEM related workshops
- Helped design/modify the 3 day workshop
- Visited local schools to teach about astronomy/being an astronomer

### Astronomy night

College of Charleston, SC, USA

ORGANIZER

2010-2013

- Helped organize monthly event where the general public could visit the observatory
- Set up/ran physics and astronomy demonstration
- Recruited/trained new volunteers

## Computer Skills

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**Programming Languages** Proficient with IDL and Python, comfortable with Bash, experience with Matlab, Fortran, and IRAF

**Operating Systems** Skilled with Linux, Windows, and MAC OS X

**Tools and Systems** Expert with LaTeX and Mathematica, familiar with ArcGIS

## Language Skills

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**English** Native speaker

**Spanish** 8 years of formal academic training

**Danish** Basic comprehension

## Academic Service

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**SOC**

TBD, Denmark

ANNUAL DANISH ASTRONOMY MEETING

TBD

**Board member**

KVINDER I FYSIK

*Technical University of Denmark*

*October 2021 - present*

**Organizer**

ASTRONOMY & ASTROPHYSICS SEMINAR

*Technical University of Denmark*

*September 2021 - present*

**SOC/session chair**

ANNUAL DANISH ASTRONOMY MEETING

*Fredericia, Denmark*

*May 2022*

**SOC/VOC/session chair**

EMERGING RESEARCHERS IN EXOPLANET SCIENCE SYMPOSIUM

*Online*

*June 2021*

**Session chair**

AAS WINTER MEETING

*Honolulu, Hawai'i*

*January 2020*

**SOC/LOC/session chair**

EMERGING RESEARCHERS IN EXOPLANET SCIENCE SYMPOSIUM

*Cornell University*

*June 2019*

**LOC/session chair**

EMERGING RESEARCHERS IN EXOPLANET SCIENCE SYMPOSIUM

*Pennsylvania State University*

*June 2018*

**LOC/session chair**

EMERGING RESEARCHERS IN EXOPLANET SCIENCE SYMPOSIUM

*Yale University*

*June 2017*

**SOC/LOC/session chair**

EMERGING RESEARCHERS IN EXOPLANET SCIENCE SYMPOSIUM

*Cornell University*

*June 2016*

**Organizer**

CORNELL PLANETARY LUNCH SEMINAR

*Cornell University*

*August 2015 - May 2016*

**Reviewer**

*Astrophysical Journal*