ASHLEY BAKER

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SUMMARY

Instrument scientist/astronomer working on the design, development, and commissioning of instruments for Keck and Palomar Observatories with a focus on exoplanet characterization using AO-fed spectrographs.

PROFESSIONAL EXPERIENCE

Caltech Optical Observatories, Pasadena, CA — Jul 2022 – Present
Instrument Scientist

- Instrument scientist for the Keck-HISPEC instrument, a diffraction-limited AO-fed NIR spectrograph aiming to do precise radial velocities and direct spectroscopy of exoplanets.
    - Owner of HISPEC's end-to-end instrument performance simulator used to inform key design decisions, check L1 requirements, and define L2 and L3 requirements.
    - Manage the tracking camera cryostat design and testing plans as well as participate in the data reduction pipeline and calibration subsystem design development.
    - Facilitate discussion with the HISPEC science team and present at international conferences.
    - Perform lab tests and on-sky observations with existing instruments to de-risk design concepts.
- Instrument scientist for TMT-MODHIS
    - Manage the instrument performance and throughput budgets and maintain the online exposure time calculator in coordination with TMT.
- Served as a co-PI on behalf of HISPEC for an NSF MRI led by Keck Observatory

Caltech Astronomy Department — Aug 2020 – July 2022
51 Pegasi b Postdoctoral Fellow

- Led the design, assembly, and testing of HIRAX, a multi-band photometer for Palomar testing the application of narrowband filters for exoplanet characterization.
    - Defined instrument requirements, worked with mechanical engineers, wrote the control software.
- Designed the optics, aligned, and commissioned a UV double pass spectrometer for the Keck Planet Finder.
- Led the detector characterization and performance analysis of KPF's two 16Mpx CCDs.

UPenn, Philadelphia, PA — Sept 2014 – Aug 2020
Graduate Student Researcher

- Designed and built a completely autonomous precipitable water vapor monitoring instrument for Whipple Observatory to support an exoplanet transit survey.
- Developed a unique telluric fitting algorithm to generate telluric-corrected solar atlas and test the integrity of water vapor line lists.
- Led the student outreach group at Penn.
    - Organized the astronomy department's involvement in annual science fairs including planning for demos and science handout materials as well as coordinating volunteer schedules.

EDUCATION

University of Pennsylvania, Philadelphia, PA — **2014 -** 2020
PhD — Physics and Astronomy

University of Chapel Hill, Chapel Hill, NC — **2010 -** 2014
Bachelor of Science — Physics and Astronomy

SKILLS & OTHER

Skills: Zemax, Python, Linux, Cryogenic Design, System Performance, Detector Characterization, Optical Alignment
Activities/Interests: Cycling, Rock Climbing, Hiking, Plants