

# Welcome to "Image Sensors for Precision Astronomy 2024!"

## ISPA 2024 Image Sensors for Precision Astronomy

*Addressing the challenges of making state-of-the-art measurements with imperfect detectors.*

Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) at SLAC  
March 12–14, 2024

*The 5th workshop on Image Sensors for Precision Astronomy (ISPA) convenes astronomers and detector experts to address the challenges of making state-of-the-art measurements with imperfect detectors. Attendees will assess the impact of detector systematics on science goals and discuss strategies for characterization, calibration, and mitigation. The scope of ISPA includes detector issues in any sensor type which affect applications such as photometry, astrometry, spectroscopy, coronagraphy, and shape measurement.*

<https://www.bnl.gov/ispaworkshop/events/>

### Archive of Past Events

Expand to search page.

ISPA 2018

PACCD 2016

PACCD 2014

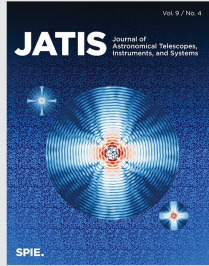
PACCD 2013

# Journal of Astronomical Telescopes, Instruments, and Systems

Editor-in-Chief: Megan Eckart, Lawrence Livermore National Lab, USA

The *Journal of Astronomical Telescopes, Instruments, and Systems* (JATIS) covers development, testing, and application of telescopes, instrumentation, techniques, and systems for ground- and space-based astronomy.

On the cover: the figure is from the Gold Open Access paper "[Hybrid propagation physics for the design and modeling of astronomical observatories: a coronagraphic example](#)" by Jaren N. Ashcraft et al. in Vol. 9, Issue 4.



Sincerest thanks to our *guest editors* for the JATIS special section, drawn from our illustrious SOC members!!

## IMAGE SENSORS FOR PRECISION ASTRONOMY

### Publication Date

October-December 2024

### Submission Deadline

1 May 2024

[Submit a Manuscript](#)

[Author Guidelines](#)

### Guest Editors

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### Scope

This special section of JATIS focuses on addressing the challenges of making state-of-the-art measurements with imperfect detectors. As science objectives in astronomical sciences demand greater and greater fidelity and sensitivity, so too does the need for understanding and/or mitigating such imperfections.

This is a broad topic. Examples of the areas of interest for this special section include:

- New detector technologies including but not limited to:
  - narrow-gap semiconductor [e.g., IR] detectors;
  - CMOS;
  - Skipper;
  - MKIDs;
  - SNSPDs.
- Software/algorithms for precision astronomy
  - Faint object characterization; image stacking
  - Point spread function retrieval or characterization
  - Astrometric retrieval
- Detector modeling
- Sensor and systematics characterization, including but not limited to:
  - narrow-gap semiconductor [e.g., IR] detectors;
  - CMOS detectors;
  - CCD detectors.

Addressing these topics, we envision a collection of peer reviewed papers that builds on work presented in *Detectors for Astronomy & Cosmology*, Parts 1 & 2 (JATIS, 2019-20). A number of these new papers will be work products of contributions presented at the Image Sensors for Precision Astronomy workshop, held at SLAC National Accelerator Laboratory, March 12-14, 2024. It is important to note, however, that



<https://indico.slac.stanford.edu/event/8442/>



# KIPAC Values and Code of Conduct

<https://kipac.stanford.edu/about/values-and-code-conduct>

## KIPAC's Values

At KIPAC we strive to foster a welcoming and supportive environment for all of our members and visitors as well as the broader communities of which we are part. We value compassion and respect and recognize the role they play in maintaining a thriving intellectual environment at KIPAC. These values are an essential complement to our commitment to scientific rigor and creative thinking.

KIPAC members and visitors are expected to help strengthen our community by promoting these values, for example by:

- Treating all members, visitors, and supporting staff in our community with respect;
- Adopting and encouraging the practices of attentively listening to each other, asking questions, and learning from each other;
- Proactively including people of all career levels, backgrounds, and identities in discussions;
- Avoiding sweeping negative generalizations about, for example, groups of people, fields of study, and ways of working;
- Proactively recognizing and giving credit to the work of others;
- Encouraging healthy work-life balance and recognizing that each member of our community has a unique background and set of circumstances; and
- Working to protect the well-being of all members and respecting any health or safety concerns.

KIPAC members aim to consciously engage with these values and evaluate whether our community demonstrates them. Members and visitors who are concerned about this Statement of Values not being respected are encouraged to bring their concerns to the KIPAC Director, Deputy Director, or Managing Director, or to confidential resources at Stanford<sup>1</sup>.

# KIPAC Values and Code of Conduct

<https://kipac.stanford.edu/about/values-and-code-conduct>

## Code of Conduct

Everyone at KIPAC must be treated with equity and respect. This must be the case regardless of personal identity and attributes, including but not limited to age, career seniority, caregiver status, disability, family status, gender or gender identity, mental health status, nationality or citizenship status, physical appearance, political affiliation, pregnancy status, race or ethnicity, religion or ideology, sexuality, and socioeconomic status. KIPAC does not tolerate discriminatory attitudes or behaviors; bullying, intimidation, or personal attacks; sexual harassment or unwanted attention; or other behavior that interferes with the full participation of others.

Adherence to this code of conduct is expected of everyone who participates in KIPAC activities. All members of the Stanford community and participants in our activities are also bound by the **University Code of Conduct** and by the Stanford University **policy on sexual harassment**. Members and visitors who are concerned about a possible breach of this Code of Conduct are encouraged to bring their concerns to the KIPAC Director, Deputy Director, Managing Director, event host, and/or to available confidential resources.

Confidentiality will be maintained to the extent possible. The Director or their designate will respond to all potential violations brought to their attention; in the case of a significant potential violation, the Director or their designate will form an ad hoc committee to evaluate the potential violation and suggest potential remediations. The KIPAC Code of Conduct does not supersede laws or institutional policies of Stanford University, SLAC National Accelerator Laboratory, or home institutions of visitors, including reporting requirements these entities may have.

<sup>1</sup>Confidential resources include those described at <https://share.stanford.edu> and <https://ombuds.stanford.edu>, which are available to both Stanford and SLAC employees and students. **The SHARE (Sexual Harassment/Assault Response & Education) Title IX Office** is the University's central resource for redressing and preventing sexual harassment and violence issues experienced by all Stanford community members. Note that all Stanford faculty are mandated reporters of sexual violence and harassment and abuse of minors, as outlined at <https://titleix.stanford.edu/faqs-title-ix> and <https://cardinalatwork.stanford.edu/working-stanford/policies/protection-minors/reporting>. Anonymous questions or concerns can also be brought to the University **Ethics and Compliance Helpline** at [integrity@stanford.edu](mailto:integrity@stanford.edu) or 650-721-2667.

# EMERGENCY EVACUATION PLAN

048 - Research Office Building

Ground Floor



## FIRE

- 1. REPORT THE FIRE**
  - Call 911 on a SLAC phone
  - Use a Fire Alarm Pull Station if available
- 2. CONFINE THE FIRE**
  - Close doors to confine the fire
- 3. EVACUATE IF SAFE (YOUR JUDGMENT)**
  - Feel upper part of door—if it is hot do not open it
  - Open door slowly if it is not warm
  - Use stairway—never use elevators
- 4. GO TO THE EVACUATION ASSEMBLY AREA**
  - Report missing persons to the leader

## EARTHQUAKE

- 1. DUCK**
- 2. FIND SAFE COVER AND HOLD**
  - Keep away from windows
  - Keep away from shelving
  - Keep away from heavy objects
  - Do not use the Fire Alarm Pull Station
- 3. EVACUATE IF SAFE (YOUR JUDGMENT)**
  - Use stairway—never use elevators
- 4. GO TO THE EVACUATION ASSEMBLY AREA**
  - Report missing persons to the leader



YOU  
ARE HERE



EXIT



FIRE  
EXTINGUISHER



AUTOMATED  
EXTERNAL  
DEFIBRILLATOR



FIRE ALARM  
CONTROL  
PANEL

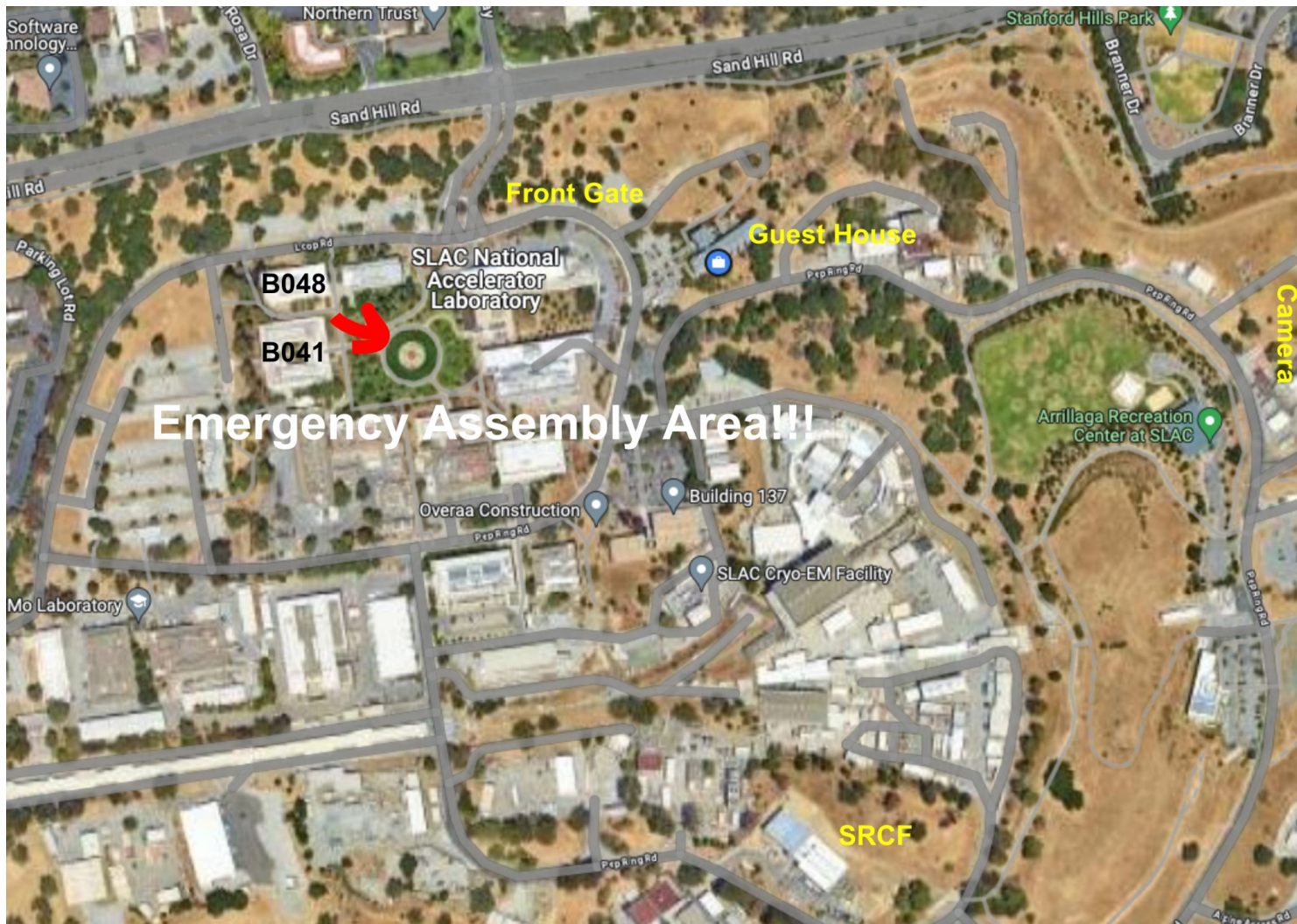


EVACUATION  
ASSEMBLY  
AREA

### 1. GO TO YOUR EVACUATION ASSEMBLY AREA

- The evacuation assembly area for Bldg 048 is located SE of building 048 (ROB) in the grass "Quad" area
- Report missing and injured persons to the assembly leader

The Evacuation Assembly Area  
is Located SE of Bldg 048  
in the grass "Quad" area



Front Gate

Guest House

B048

B041

Emergency Assembly Area!!

SLAC National Accelerator Laboratory

Overaa Construction

Building 137

SLAC Cryo-EM Facility

Arrilaga Recreation Center at SLAC

SRCF

Camera



# COVID-19 Guidelines

- SLAC currently requires travelers from international destinations to wear an N95, KN95, or surgical mask indoors for the first 5 days after arrival.
- As such, we suggest masking indoors **for all attendees** when within 6 feet of others.
- We will provide some masks and rapid COVID tests if needed.
- Do not come on-site to SLAC if you test positive for COVID or are experiencing COVID-related symptoms.
- If you test positive for COVID, please isolate in your lodging and contact Regina Matter ([regina@slac.stanford.edu](mailto:regina@slac.stanford.edu)).

# Sundries

- Food: Lunches will be provided, but if inadequate/disappointing, it may also be purchased at SLAC Cafe (or Verve if you like breakfast foods)
  - <https://rde.revelup.com/weborder/?establishment=22> - can potentially pre order online
- Internet: on site, eduroam and a self-registered Visitor network are available
  - As of this writing, eduroam is not working in B048 - it is working elsewhere..
  - We should not all get on Zoom during the plenaries to not overtax the wifi
- Speakers - please ensure your slides are available on INDICO (i.e. the presenter's laptop) before your time slot. Your convenor will connect with you to confirm. *Captioners* would also appreciate seeing your slides ahead of time to familiarize with your vocabulary/subject matter.
  - Mics are in the ceiling - they pick up everything. (go to the other half of the room if you need to eat your bag of chips).
  - There will be no mic runner for questions - just wait for the convenor to call on you. Mics are listening.
- Live captioning link: <https://captionpros.1capapp.com/event/ispa2024>
  - Google form for feedback to the captioners (e.g., technical terms):  
<https://forms.gle/nWaXYqCxSDdM4Ce86>

# Agenda

<https://indico.slac.stanford.edu/event/8442/timetable/#20240312>

The screenshot shows the Indico timetable for the event on Tuesday, March 12, 2024. The page is titled "Timetable" and includes a navigation sidebar on the left. The main content area displays a grid of sessions for the day, starting from 08:00. The sessions are as follows:

Time	Session Title	Location	Duration
08:00	Light Breakfast	48/1-112C/D - Redwood C/D, SLAC	08:00 - 08:30
08:30	Welcome/Introductory session: Keynotes	48/1-112C/D - Redwood C/D, SLAC	08:30 - 10:05
10:05	New Detector Technologies: IR sensors	48/1-112C/D - Redwood C/D, SLAC	10:05 - 10:55
10:55	coffee break	48/1-112C/D - Redwood C/D, SLAC	10:55 - 11:10
11:10	New Detector Technologies: CMOS, Skipper, MKIDs	48/1-112C/D - Redwood C/D, SLAC	11:10 - 12:25
12:25	Lunch	48/1-112C/D - Redwood C/D, SLAC	12:25 - 13:00

- Reception (Tuesday)
- Dinner (Wednesday)
  - Trellis Restaurant, 1077 El Camino Real, Menlo Park, CA 94025
- Group Photo (Wednesday)
- LSSTCam Tours (Wednesday), and sharing and finding a ride:
  - [https://docs.google.com/spreadsheets/d/1U\\_B08GYKkAXLVWBNz6q9vqcg-QQ1uxKNUd\\_uUuX8QeA/edit#gid=0](https://docs.google.com/spreadsheets/d/1U_B08GYKkAXLVWBNz6q9vqcg-QQ1uxKNUd_uUuX8QeA/edit#gid=0)

# Thank you!

Sponsors:

- KIPAC (Andrea Davis, Risa Wechsler)
- Teledyne (Tim Bruchman)
- STA (Greg Bredthauer)



# Thank you!

- Administrative and support staff:
  - Regina Matter, Glenna Paige, Jackie Chin, Ken Kobayashi, Nabil Bouali, Clarence Doan (SLAC)
- Live Captioning:
  - Natalie Holder, Linday Boyd (SLAC)
  - Kacie Adcock, Jen Schuck, Barb Bechtold (Caption Pros)
- **SOC:** Pierre Astier (LPNHE), Chris Bebek (LBNL), Susana Deustua (NIST), Juan Estrada (Fermilab), Liz George (ESO), Erika Hamden (Arizona), Claire Juramy-Gilles (LPNHE), Robert Lupton (Princeton), Eugene Magnier (Hawaii), Satoshi Miyazaki (NAOJ), Shouleh Nikzad (JPL), Paul O'Connor (BNL), John Peterson (Purdue), AAPM (SLAC), Andrew Rasmussen (SLAC, Chair), Charles Shapiro (JPL), Ian Shipsey (Oxford University), Roger Smith (Caltech), Michael Strauss (Princeton), Andrei Nomerotski (BNL, until last year).
- **LOC:** Seth Digel, Andy Rasmussen (chair), AAPM