



RATIR Design Review

UC Santa Cruz, April 17, 2009

http://ratir.org/ucsc_design_review

RATIR Team

Nathaniel Butler	(PI & Project Manager; UC Berkeley)
Joshua S. Bloom	(Co-I & Software Lead; UC Berkeley)
Alejandro Farah	(Co-I & Mechanical Design; IA-UNAM)
Julien Girard	(Co-I & User Interface; ESFM-IPN)
Jesus Gonzalez	(Co-I & Optical Design; IA-UNAM)
Alexander Kuttyrev	(Co-I & IR Dewar Lead; Goddard)
William Lee	(Co-I; IA-UNAM)
J. Xavier Prochaska	(Co-I; UCO/Lick)
Enrico Ramirez-Ruiz	(Co-I; UC Santa Cruz)
Michael Richer	(Co-I & Telescope Co-Lead; IA-UNAM)
Alan Watson	(Co-I & Telescope Co-Lead; CRyAUNAM, IA-UNAM)

(organizational details to follow in Nat's afternoon talk on management)

Review Committee

Andy Szentgyorgyi	(Chair; CfA)
Chris Bebek	(LBL)
Rebecca Bernstein	(UCO-Lick)
Bruce Bigelow	(UCO-Lick)
Harland Epps	(UCO-Lick)
Jochen Greiner	(MPA Garching)

1st Session: RATIR overview and Requirements Flowdown (8:30-10:10)

RATIR Overview, brief summary of topics to come (20min; Nat)
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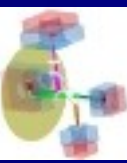
Debrief/questions for further study (4:30-5pm)

- * **Swift Cycle 5 Proposal: “GRB Correlative IR Capabilities”**
(Nov '08)
- * **High-level design/specifications & Conceptual Optical layout**
(Nov '08 - March '09)
- * **Additional Funding + Goddard Manpower**
(Jan/Feb '09)
- * **Design Revisions (HOT/COLD dichotomy)**
(March '09 – April '09)

-> RATIR Design Review

First Light in January 2010!

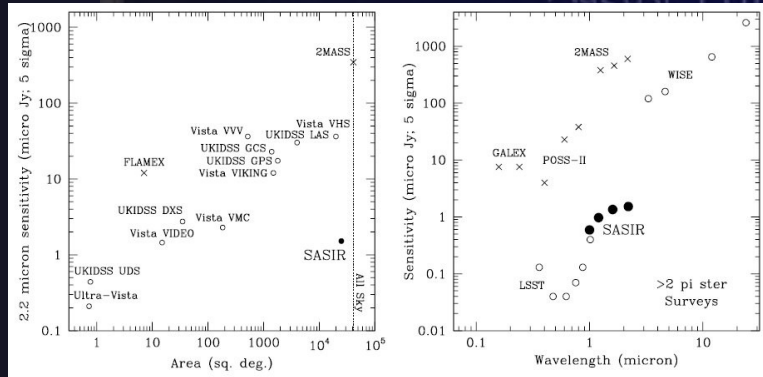
SASIR (2012-2016) Pathfinder



~124 IR arrays - 6.5m telescope
Image entire sky every 3 months (~YJHK bands)

Objectives:

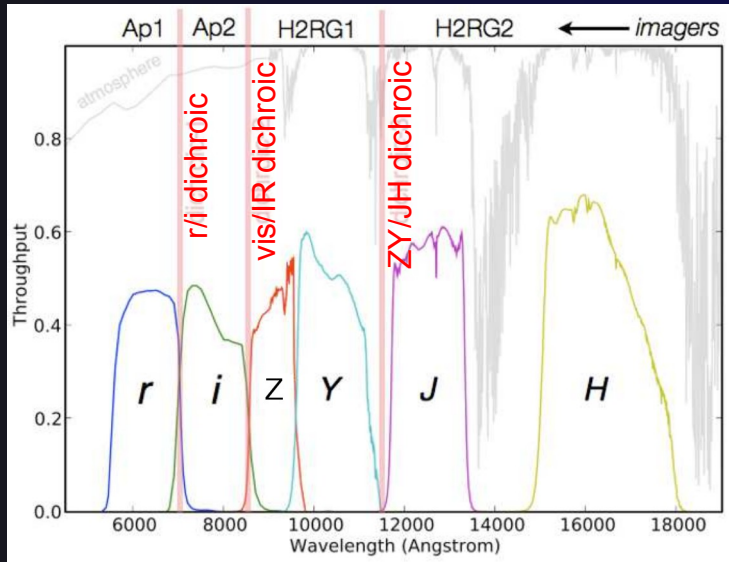
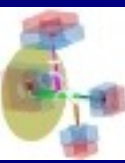
Census of nearby stars (to 50 pc)
Most Distant Quasars ($z > 8$)
Infra-red Distance Ladder (cepheids, SNe Ia+IIp)
Gravity Wave / Neutrino Followup
Earth Mass Planets Around T, L, M- dwarf stars.



PI J. Bloom, <http://www.sasir.org>

Near IR LSST:
All-sky to a level 100-500 x 2MASS

RATIR Overview



Reionization and Transients InfraRed CAMERA

6 channel optical/NIR imager

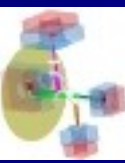
(associated project **RATTEL**)

Funded by Swift to:

- Infer high- z ($z > 6$) GRBs
- Measure Early Afterglows

But most time Mexican Non-ToO
Science

US / Mexico Collaboration



Establish:

- IR Sky brightness for SASIR
- Infrastructure / Roboticization
- Experience with IR detectors

UNAM (Universidad Nacional Autonoma de Mexico)

INAOE (Instituto Nacional de Astrofisica, Optica y Electronica)

- Monitoring of blazars

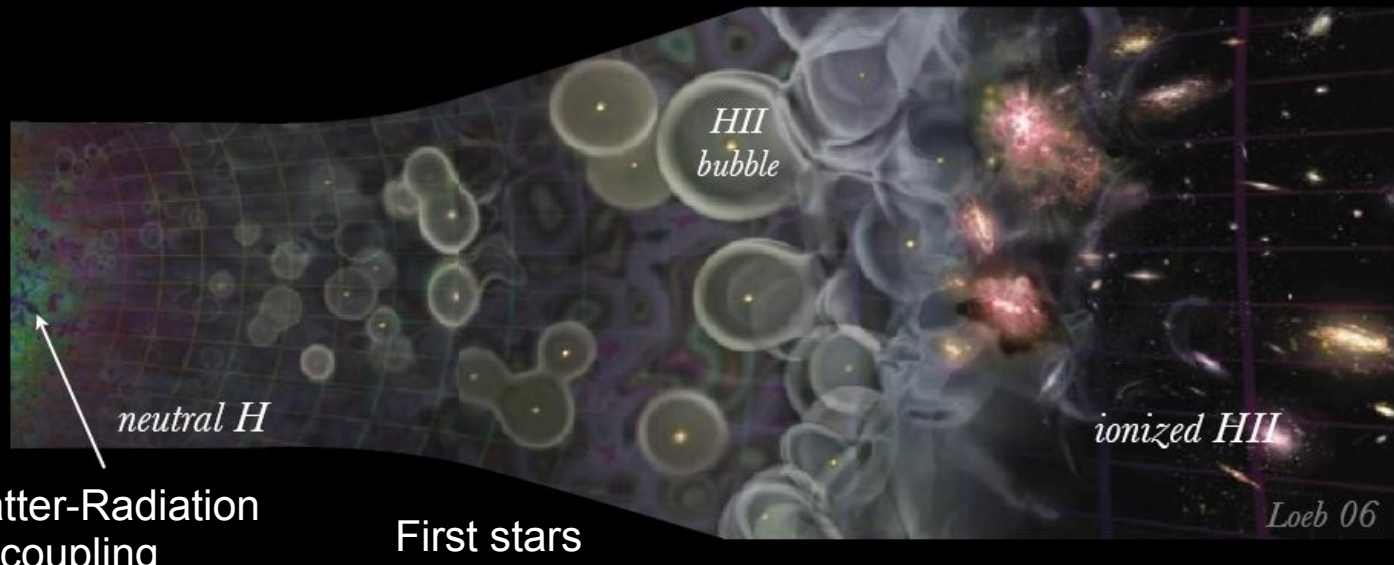
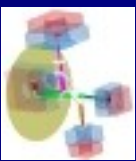
- Identification and Classification of Integral IBIS sources

- Extended Observations of GRBs

- Variability in young embedded stellar clusters

- Mira variables in nearby galaxies

Primary Science: Epoch of Reionization



Matter-Radiation
Decoupling
 $z=1100$ (CMB)

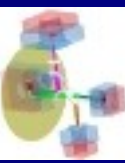
First stars
("Pop III")
 $z=20-30$

"reionization"
 $z\sim 8-15$

Most-distant
known
galaxies
 $z=7$

See, William Lee's Talk, Science and Flowdown

Dedicated 1.5m Telescope

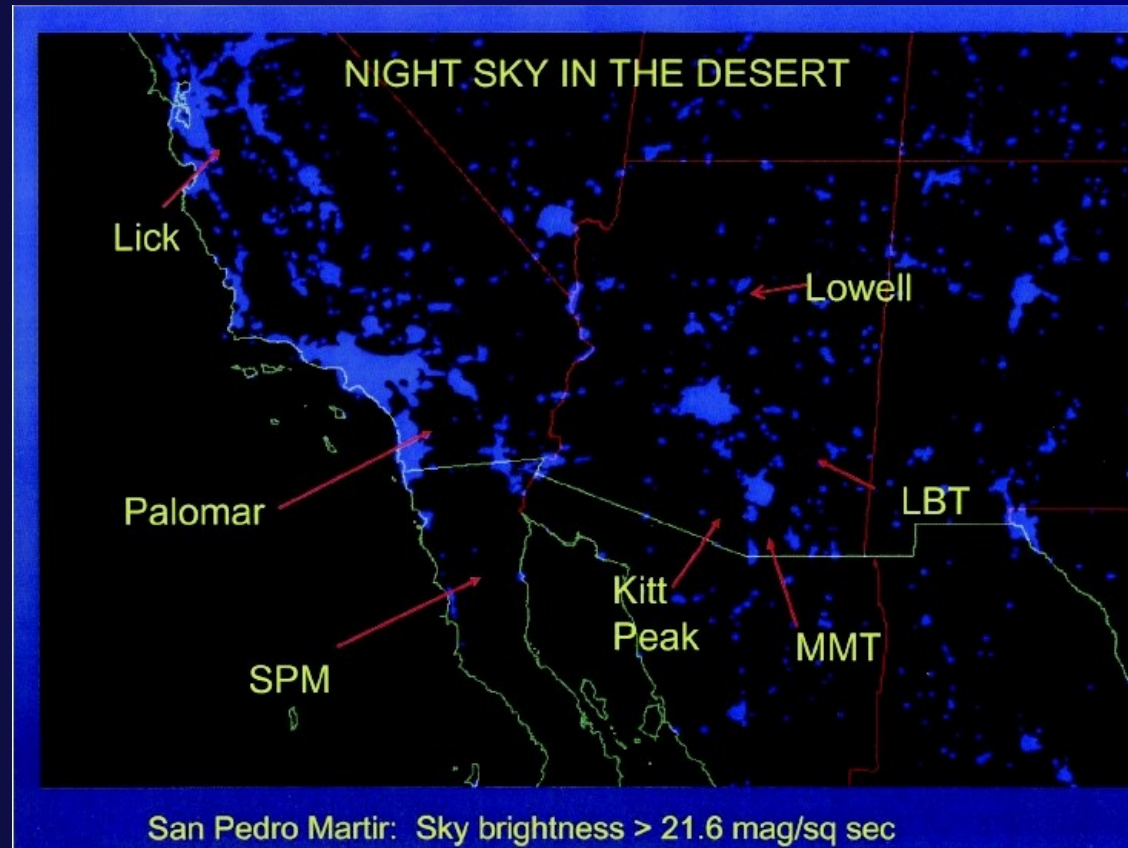


Excellent site!

2800m above sea

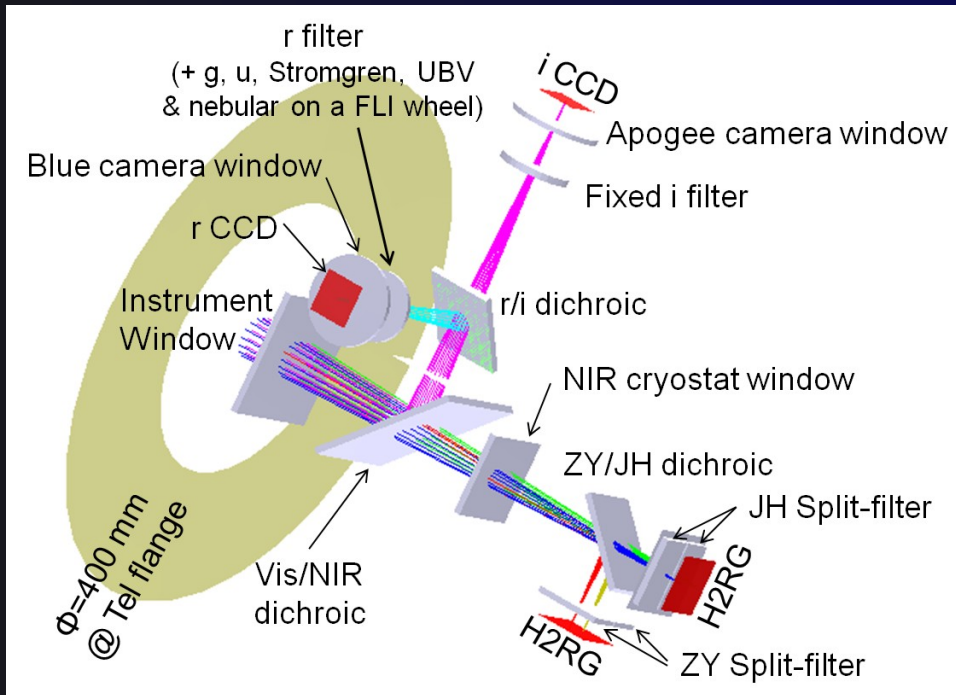
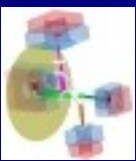
>61% nights photometric
>81% spectroscopic
(20yr study: Tapia '03)

San Pedro Martir (for 2yrs)



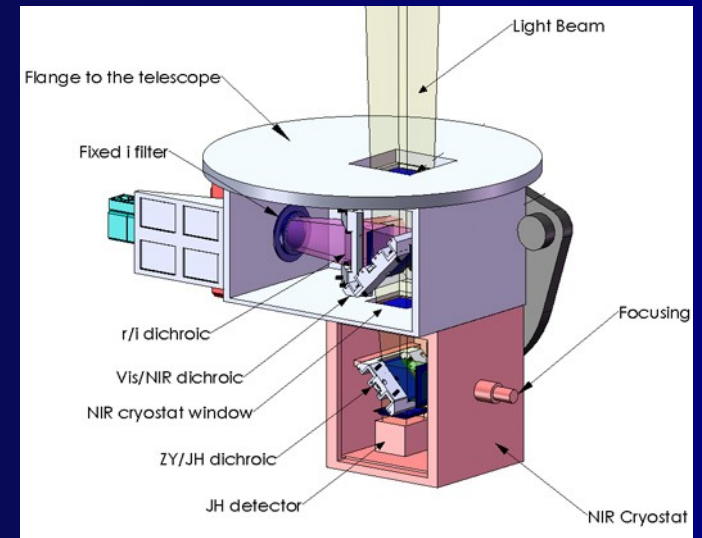
Telescope Talk by Alan Watson

Optical / Mechanical Designs

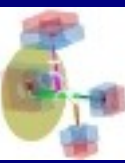


Optical Design, Talk by Jesus Gonzalez (Chucho)

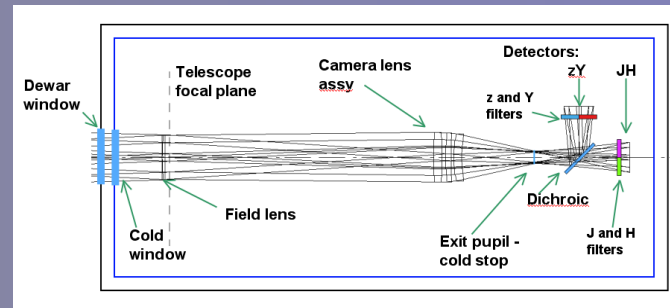
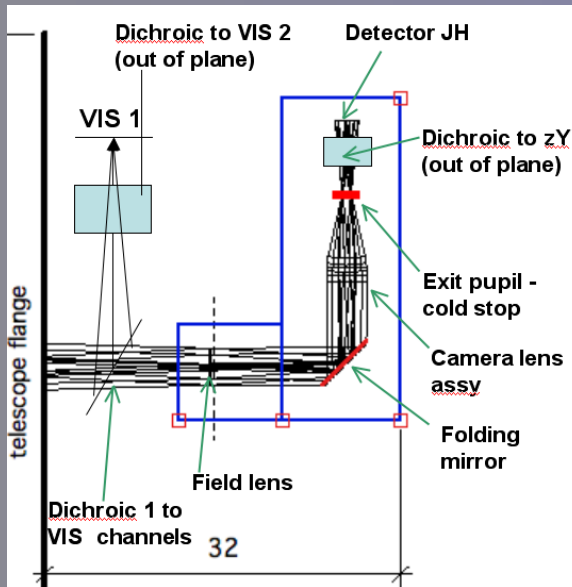
Mechanical Design, Talk by Alex Farah



IR Dewar Design

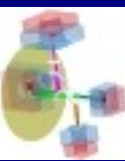


Pursuing a COLD system, w/ ~same interface as WARM system.

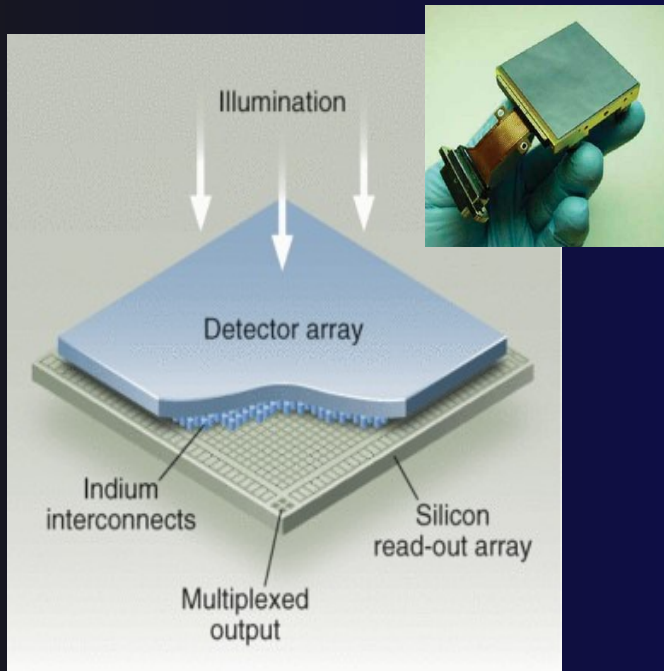


IR Design, Talk by Alexander Kutryev

Detectors

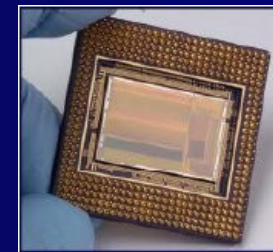


- * Off-the-shelf Apogee Optical Camera's
- * Teledyne H2RG arrays for NIR –
(buy/borrow, 2.5 μm set-aside for us!)

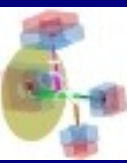


Talk by Alexander Kuttyrev

Utilize Teledyne “SIDE CAR” ASICs to write direct fits (Talk by Josh Bloom)



Wrap-up



Afternoon Sessions:

User Interface talk from Julien Girard
Software and Data from Josh Bloom
Management from Me

Review panel Executive Session & Report Back

Dinner at 5pm!

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