The Synoptic All Sky InfraRed Survey (SASIR)

William Lee
Instituto de Astronomía, Observatorio Astronómico Nacional, UNAM
for the SASIR collaboration
wlee@astro.unam.mx arXiv:0905.1965

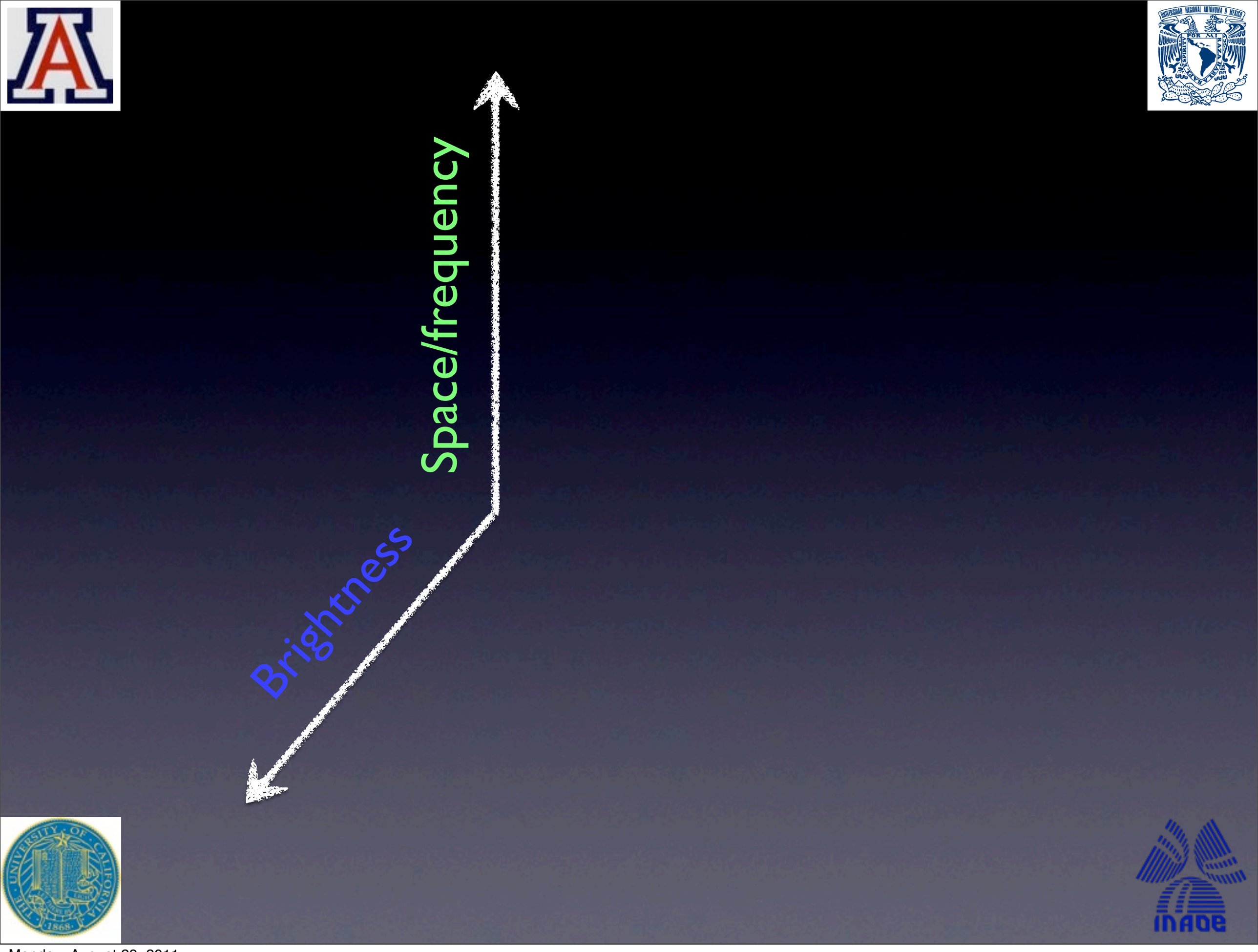
Ischia, August 29 2011

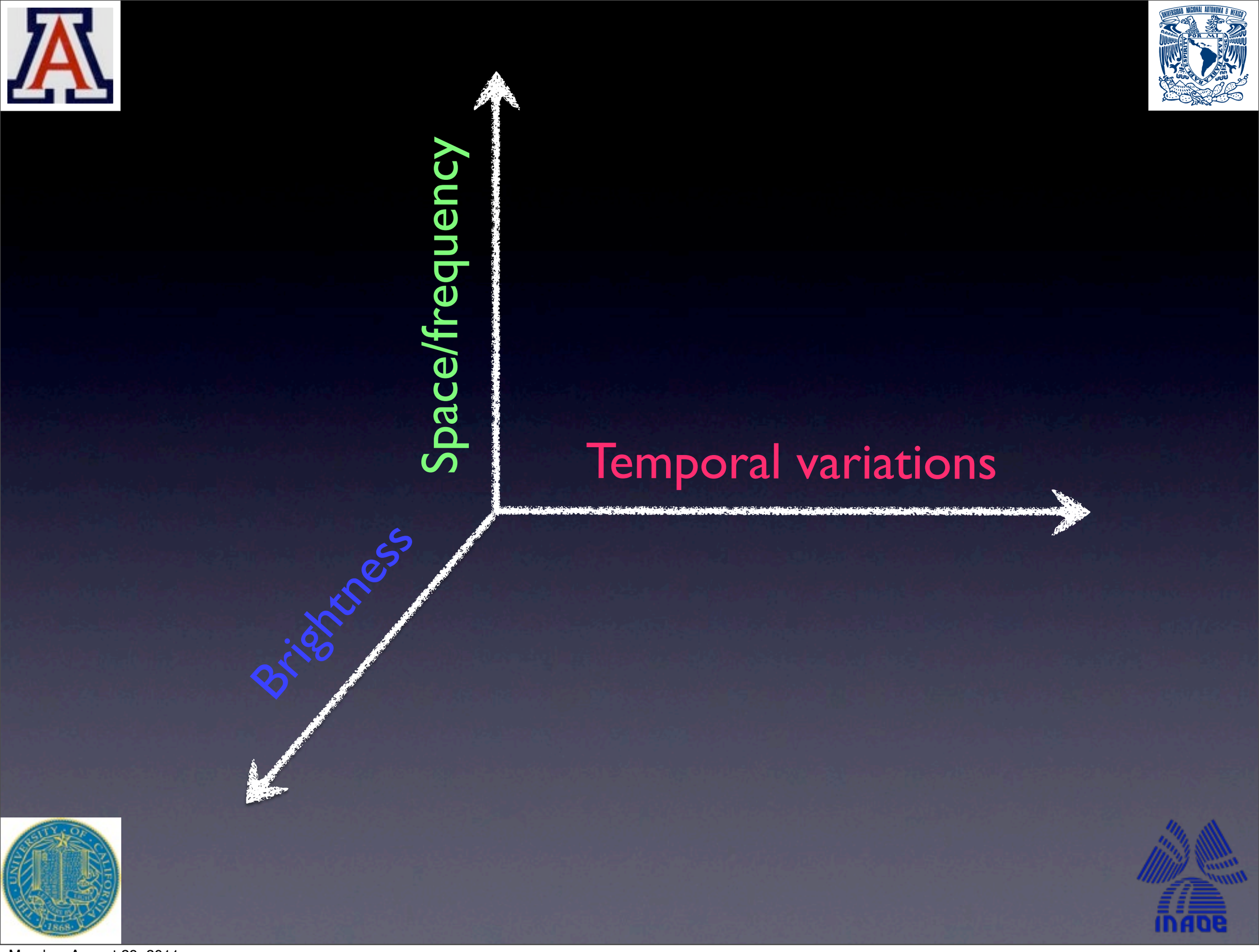
WMAP

optical

2MASS

Fermi


Space/frequency
Brightness


Space/frequency
Temporal variations
Brightness

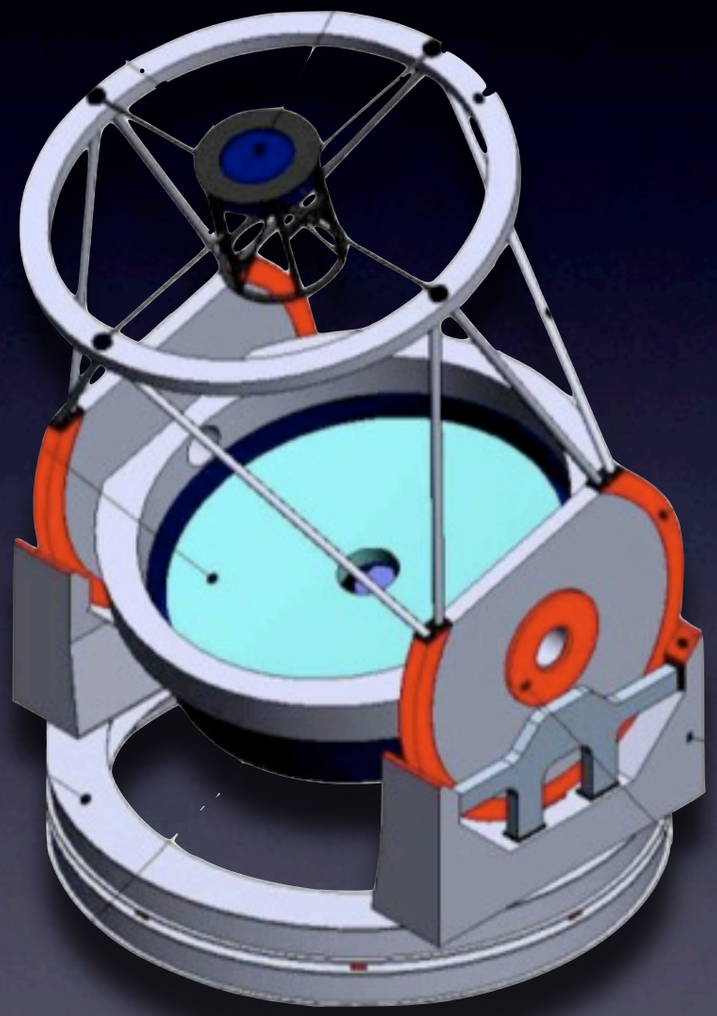
Space/frequency

Temporal variations

Brightness

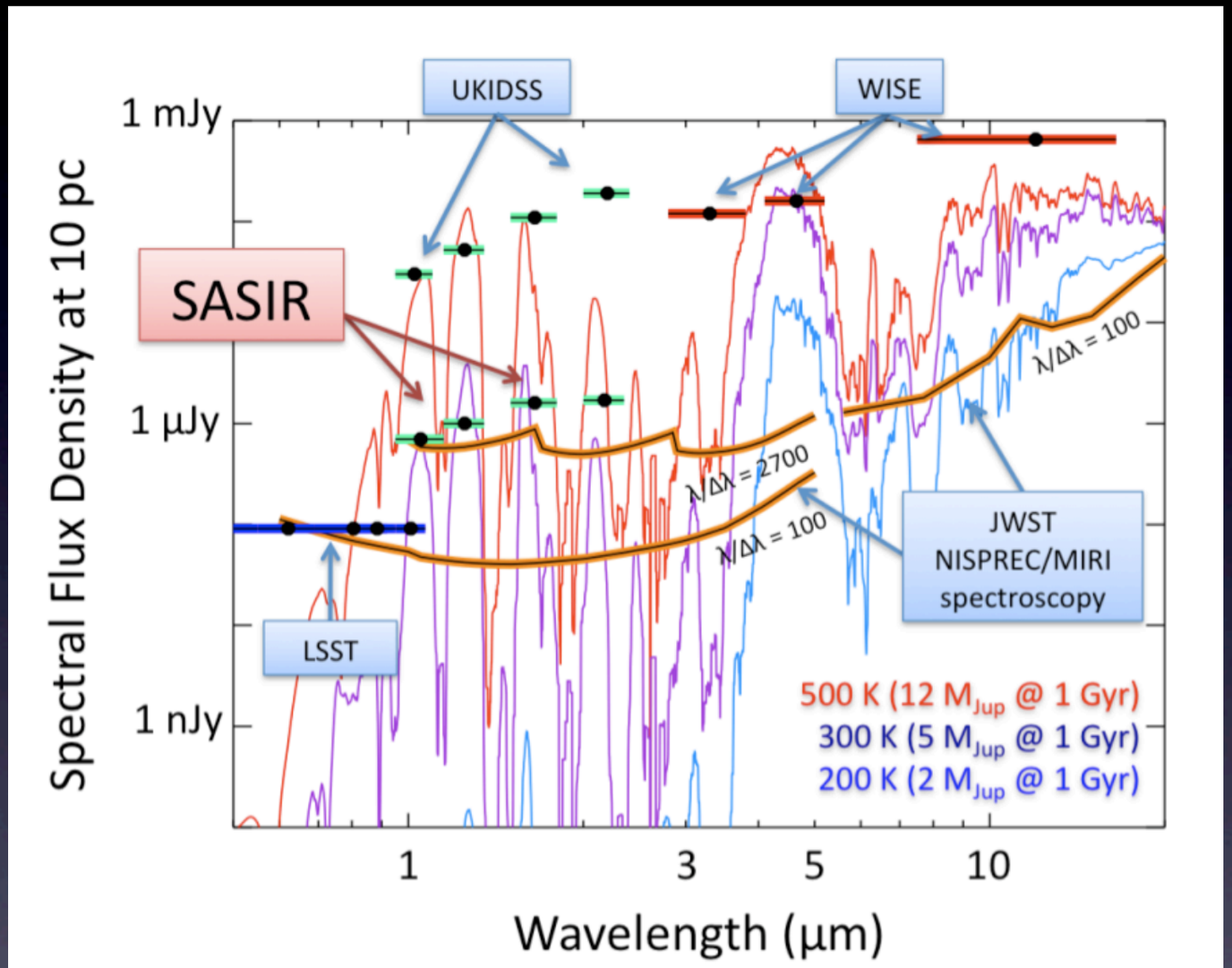
SASIR + connection between electromgnetic and gravitational and neutrino signatures

SASIR in a nutshell



- 6.5m telescope
- Simultaneous YJHK imaging
- Detectors: 124 2k x 2k IR arrays
- 0.5Gpx camera
- ~1 deg. FoV
- ~80s exposures
- Repeated sky coverage every ~3months
- Full survey in ~4 years
- Various science-dependent sub-surveys
- ~1TB/night in data
- Site: San Pedro Mártir, B.C.
- Magellan inspired design

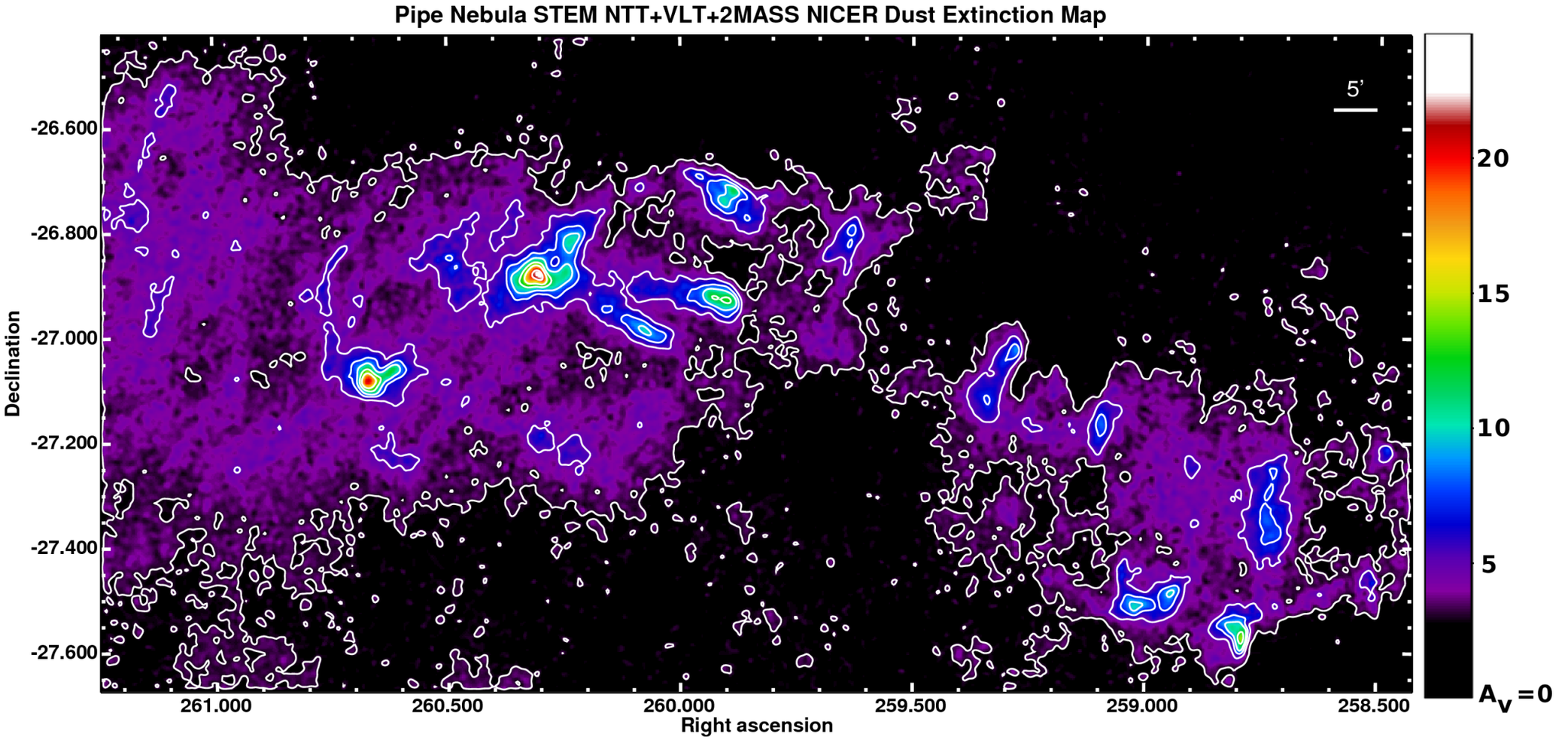
Low-T neighbors



- Brown dwarfs are an important fraction of the population in the local volume
- The shape of the low end of the IMF helps understand both star and planet formation
- Provide a huge volume limited catalog of all L and T dwarfs, as well as a large sample of Y dwarfs
- Potentially find free floating planets

G. Hallinan, A. Burgasser

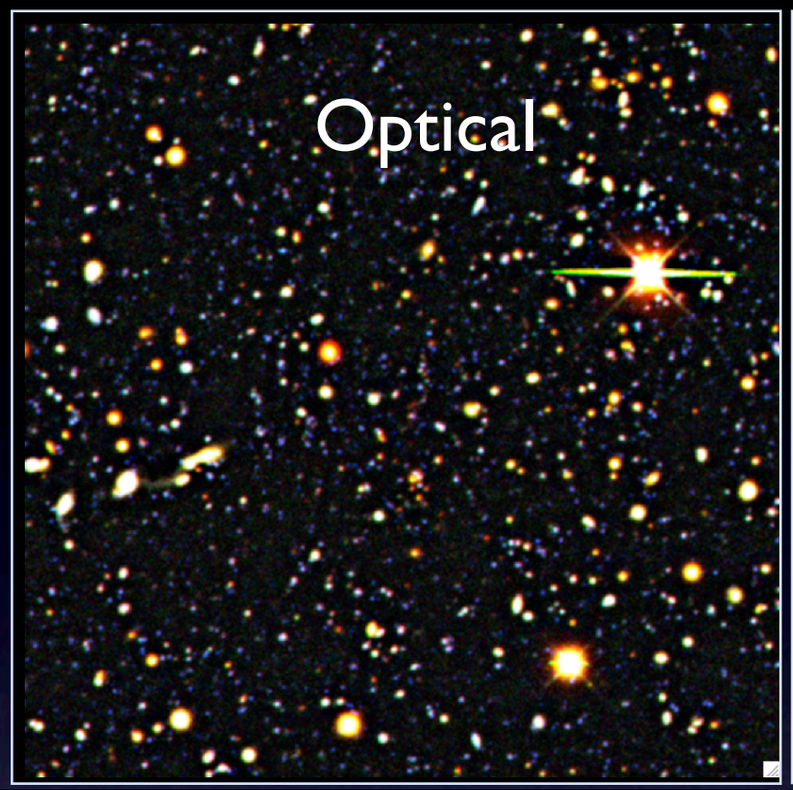
Galactic extinction maps

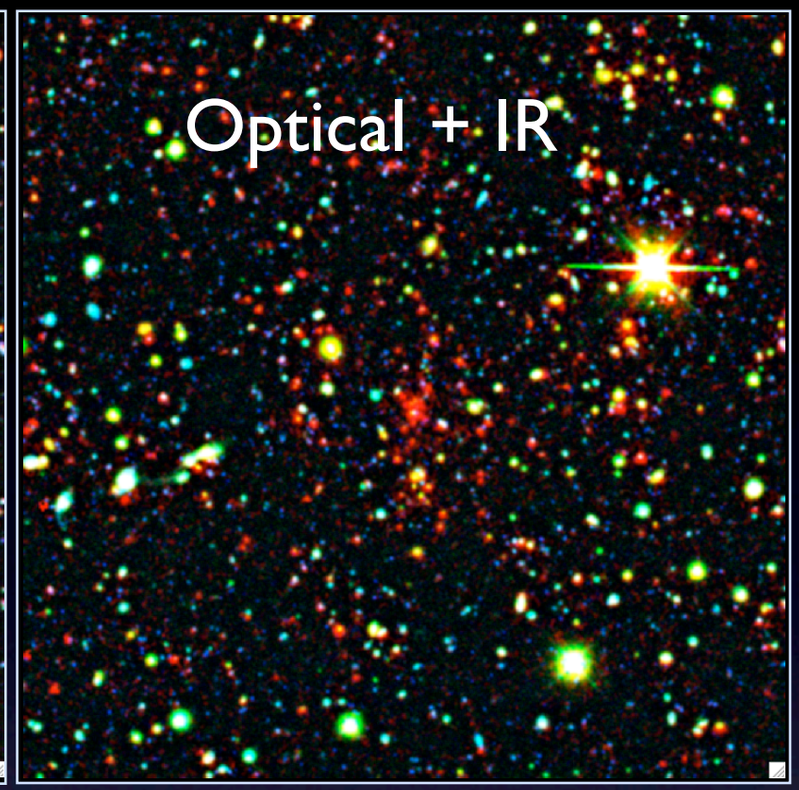


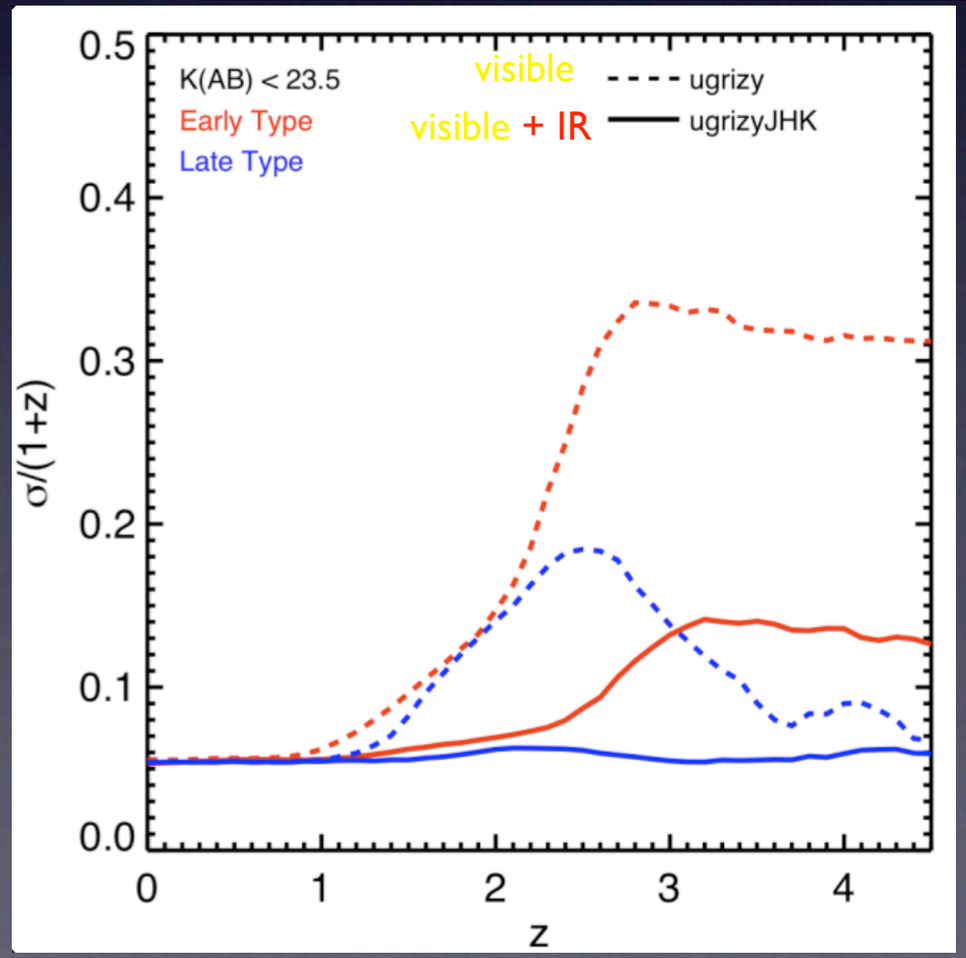
- Using a standard extinction law on reasonably dense fields will provide maps for large regions of the galaxy
- 2MASS able to measure only nearby SF clouds. SASIR will extend this much further

Román-Zúñiga+ 10

Galaxy Clusters



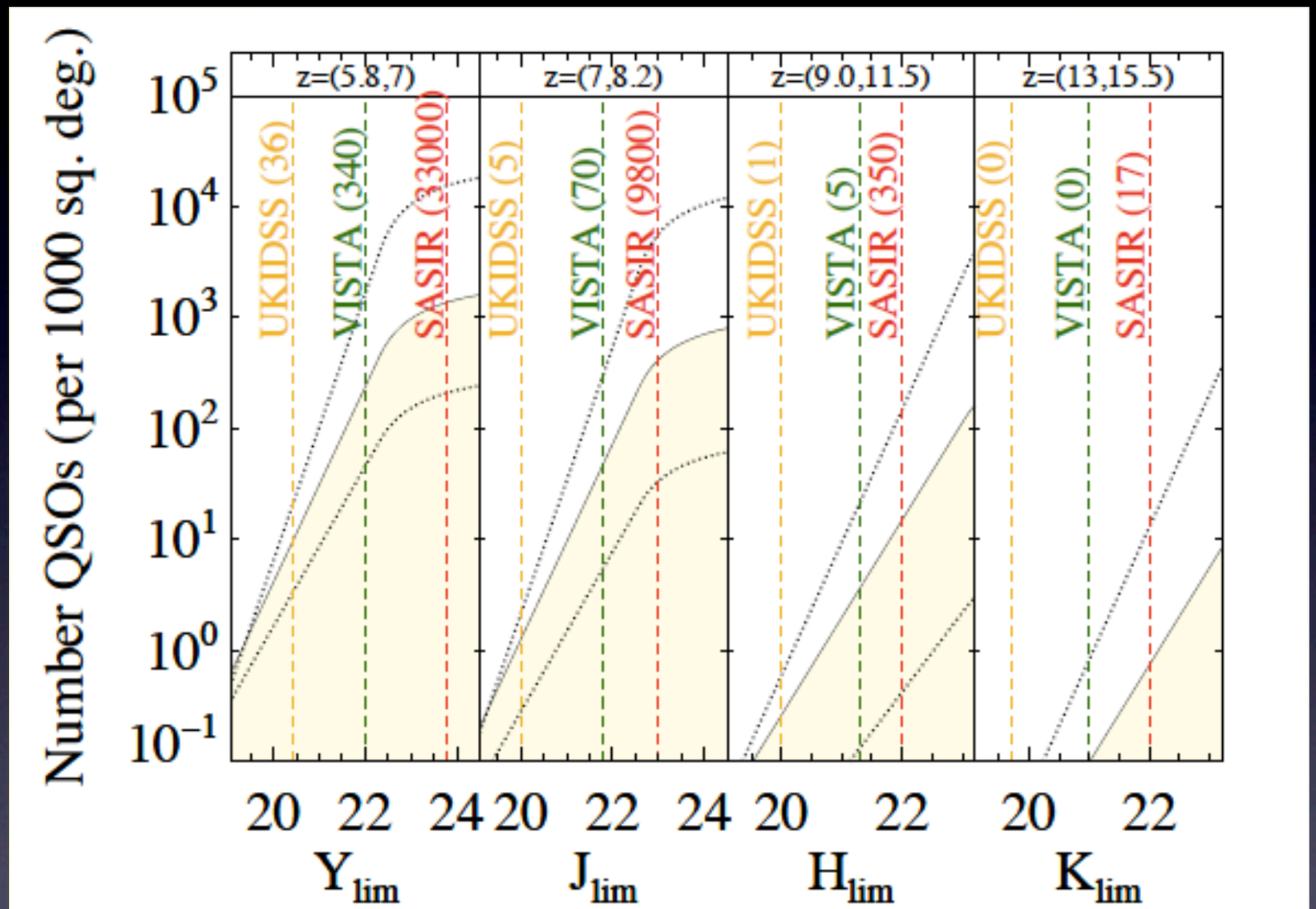




- SFR peaks at 1<z<2, most of current stellar mass is created at this point (~10,000 clusters expected)
- k-correction makes red galaxies fade quickly with redshift

Stanford+ 09

High-z QSOs

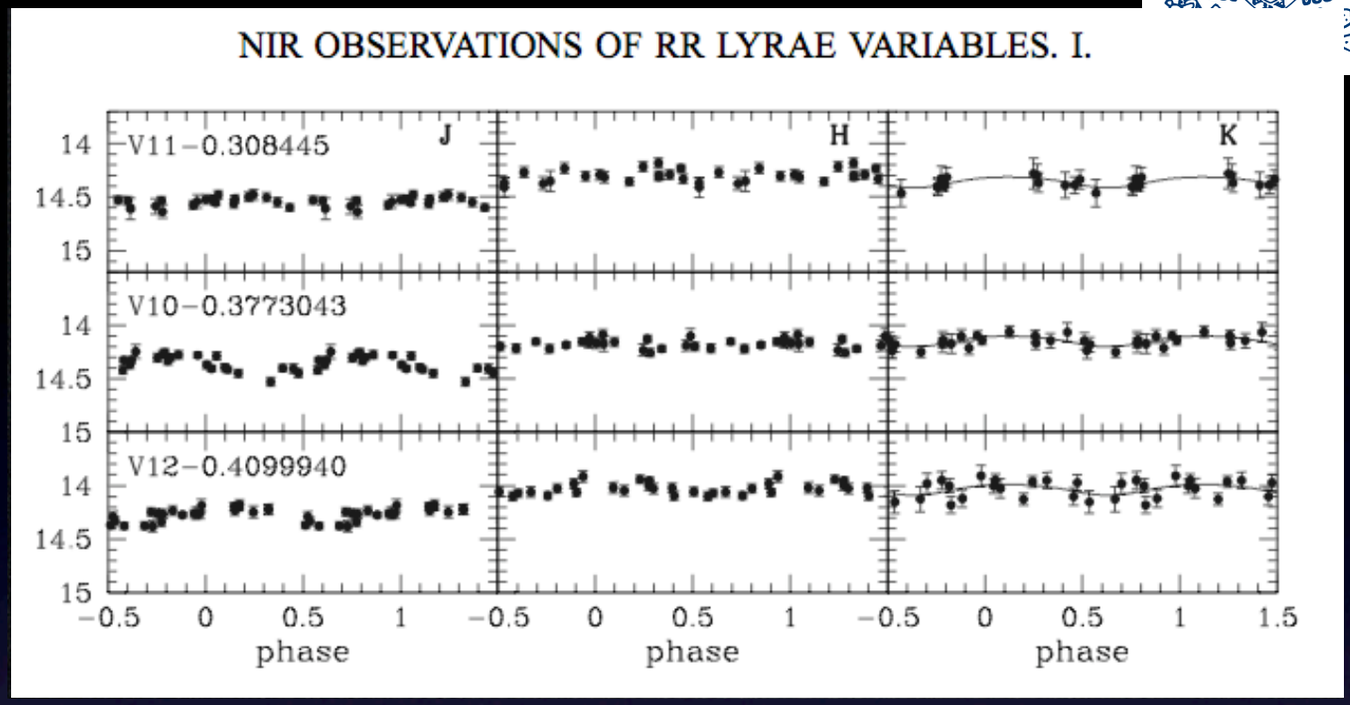


- Two orders of magnitude more QSOs than other planned surveys at z~6
- Will provide enough quasars for JWST re-ionization probes

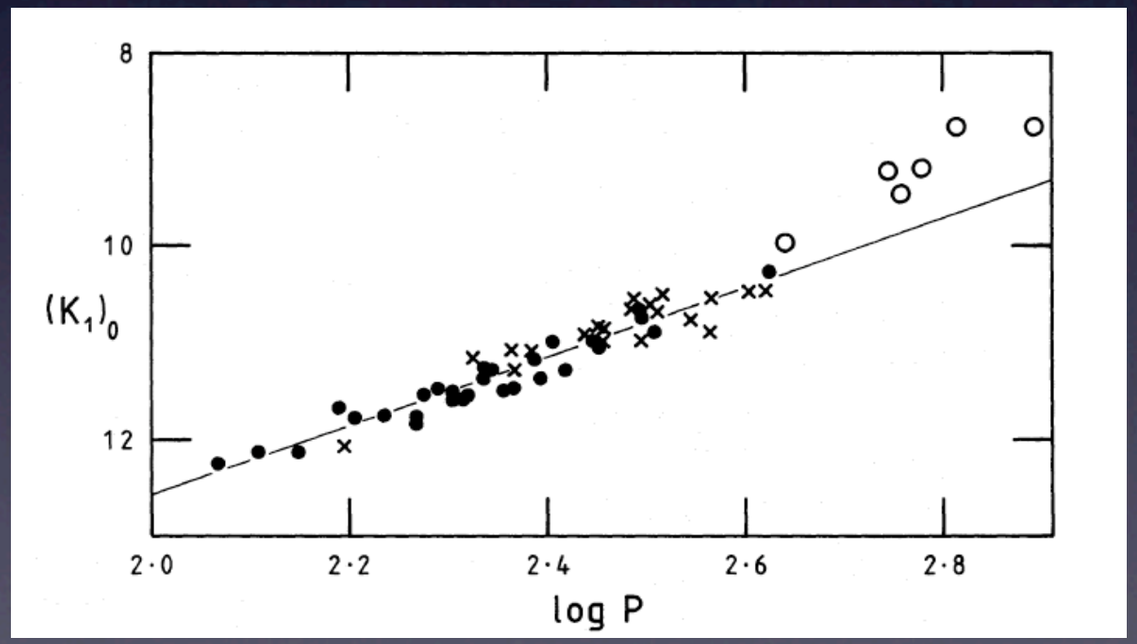
J.X. Prochaska

Variable stars

- Light curves for RRLyrae and Cepheids are less dependent on metalicities in the IR



Del Principe+ 05

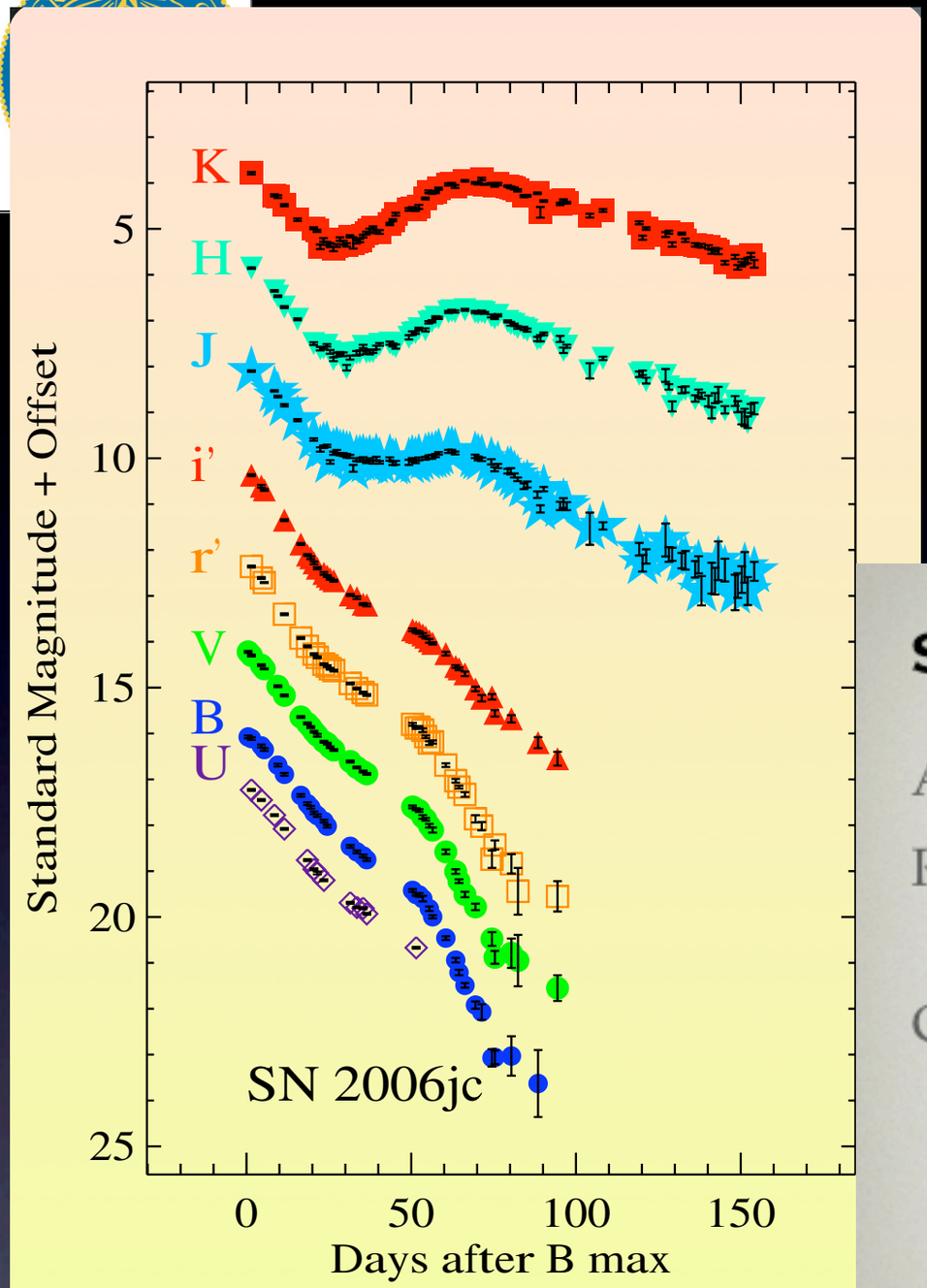


Feast 08

- Light curves for MIRA variables are independent of metallicity
- They are bright, can trace distances for further galaxies (few Mpc)
- Periods of hundreds of days

Supernovae

- Fewer corrections needed for light curves in the infrared for SN Ia
- IR emission is more luminous and lasts longer
- Large number of SN (hundreds per year) will provide better cosmological constraints



Modjaz+ 09

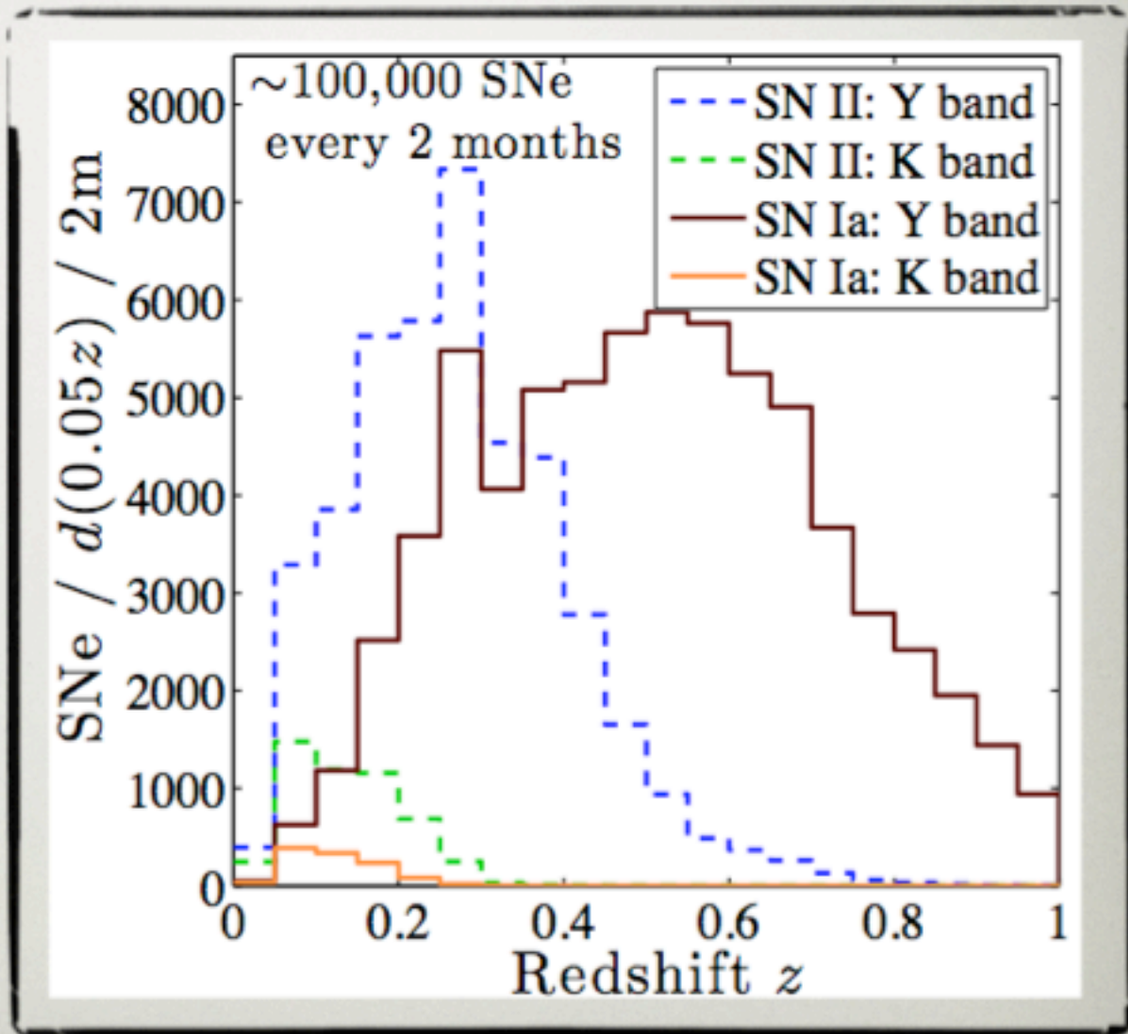
Filippenko 10

SASIR Predictions – 2 Scenarios

All year, all sky.

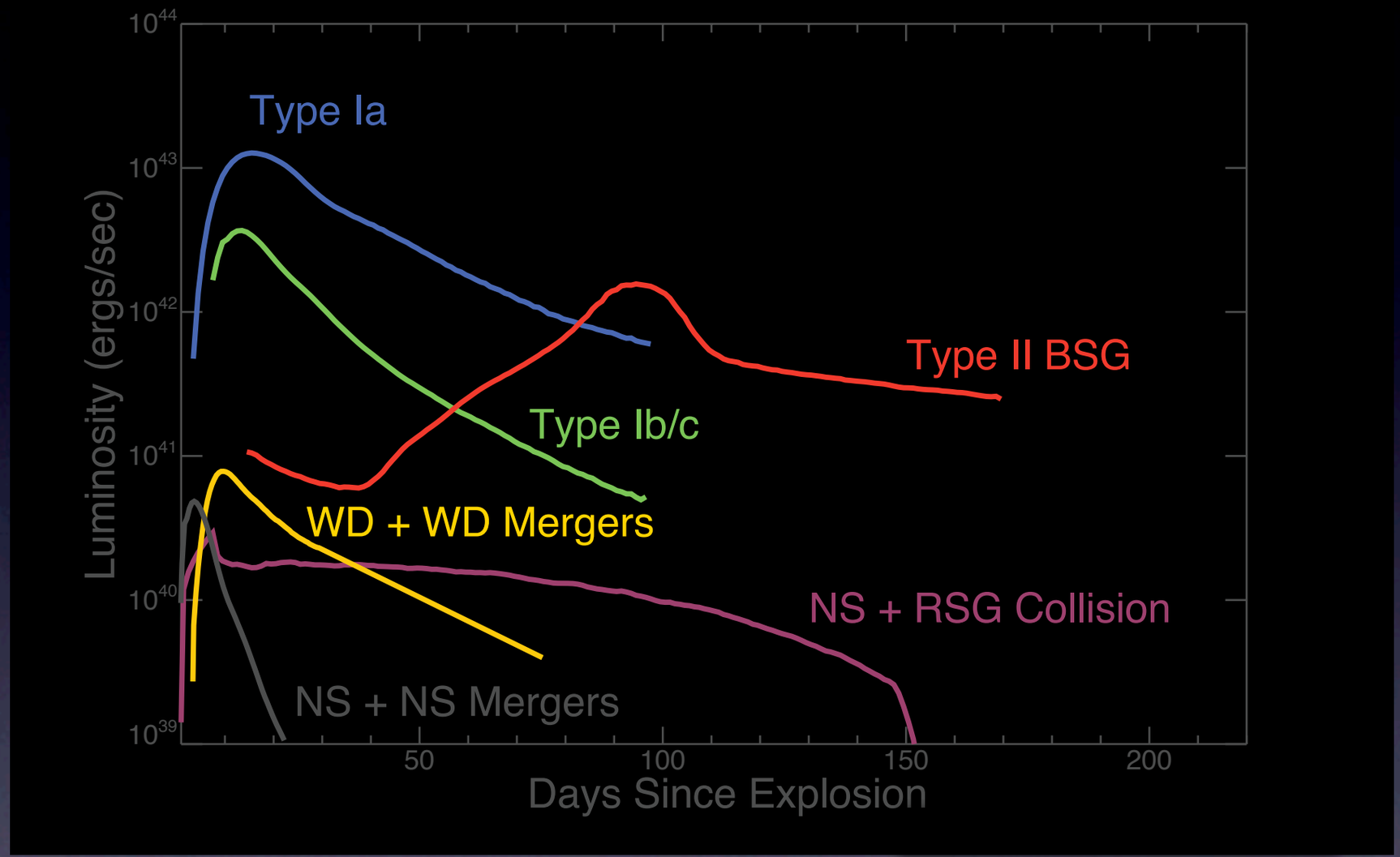
Repeat observation of 15,000 deg².

Cadence of 2 months.



(Keren Sharon and Dovi Poznanski)

Transients around compact objects



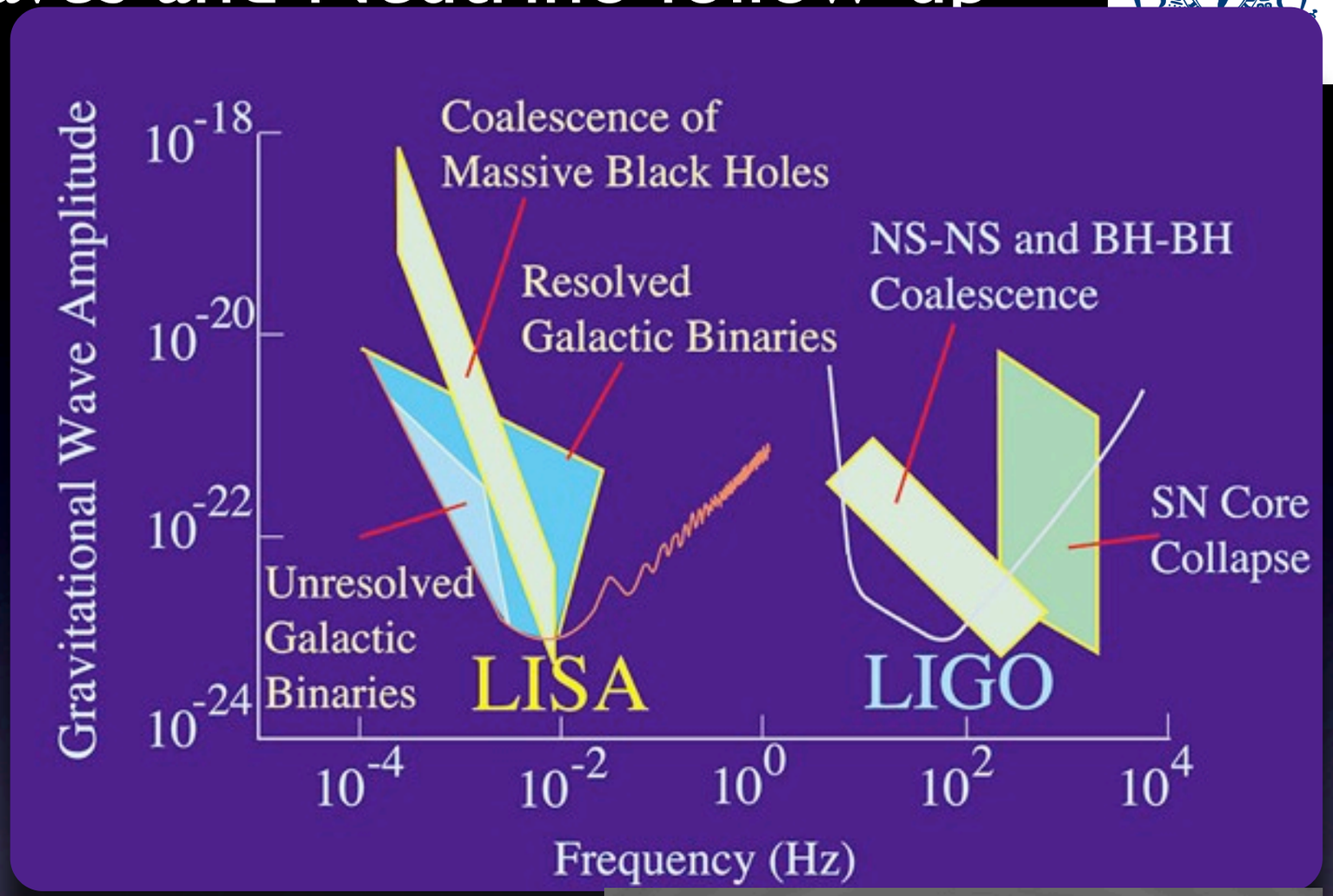
- There are currently a handful of examples of transients around compact objects
- A large survey (unaffected by dust) will help characterize this regime

+ SMBH (IMBH?) acretion flares, X-ray binaries, soft X-ray transients, pulsars...

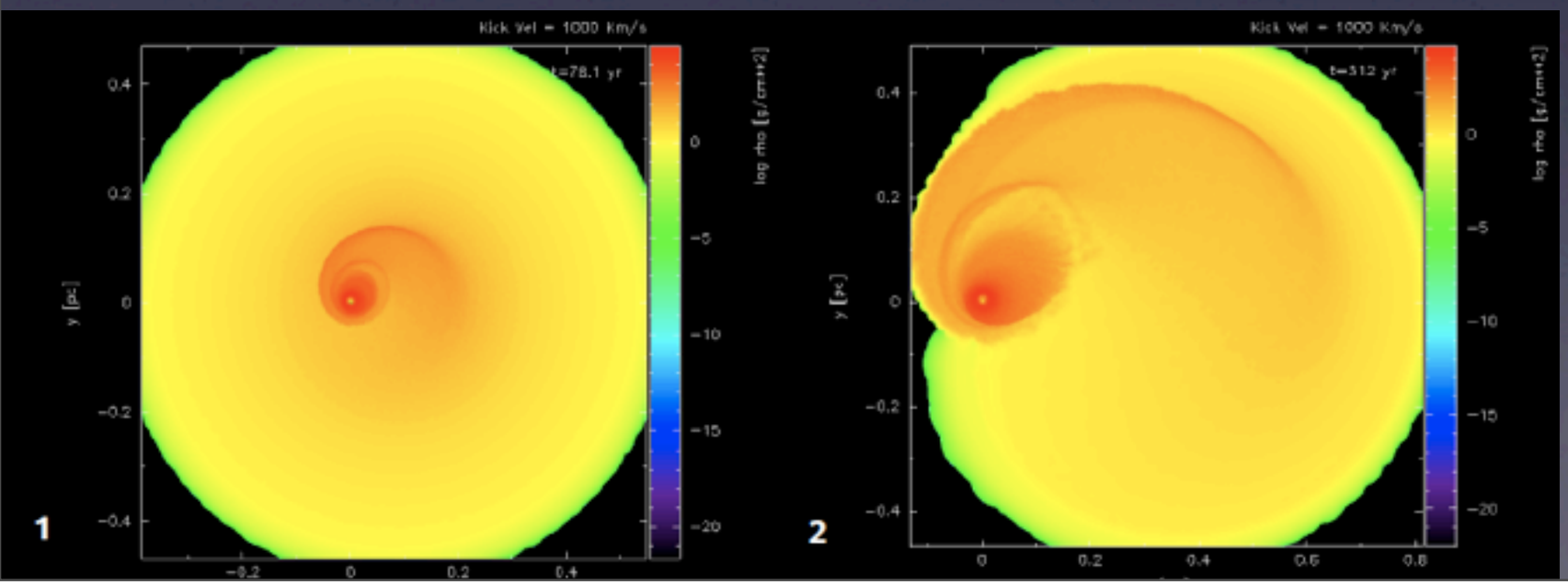
E. Ramirez-Ruiz, D. Kasen

Gravitational waves and Neutrino follow-up

- SASIR wide field will help locate gravitational wave events which have very low spatial accuracy (~1 deg)

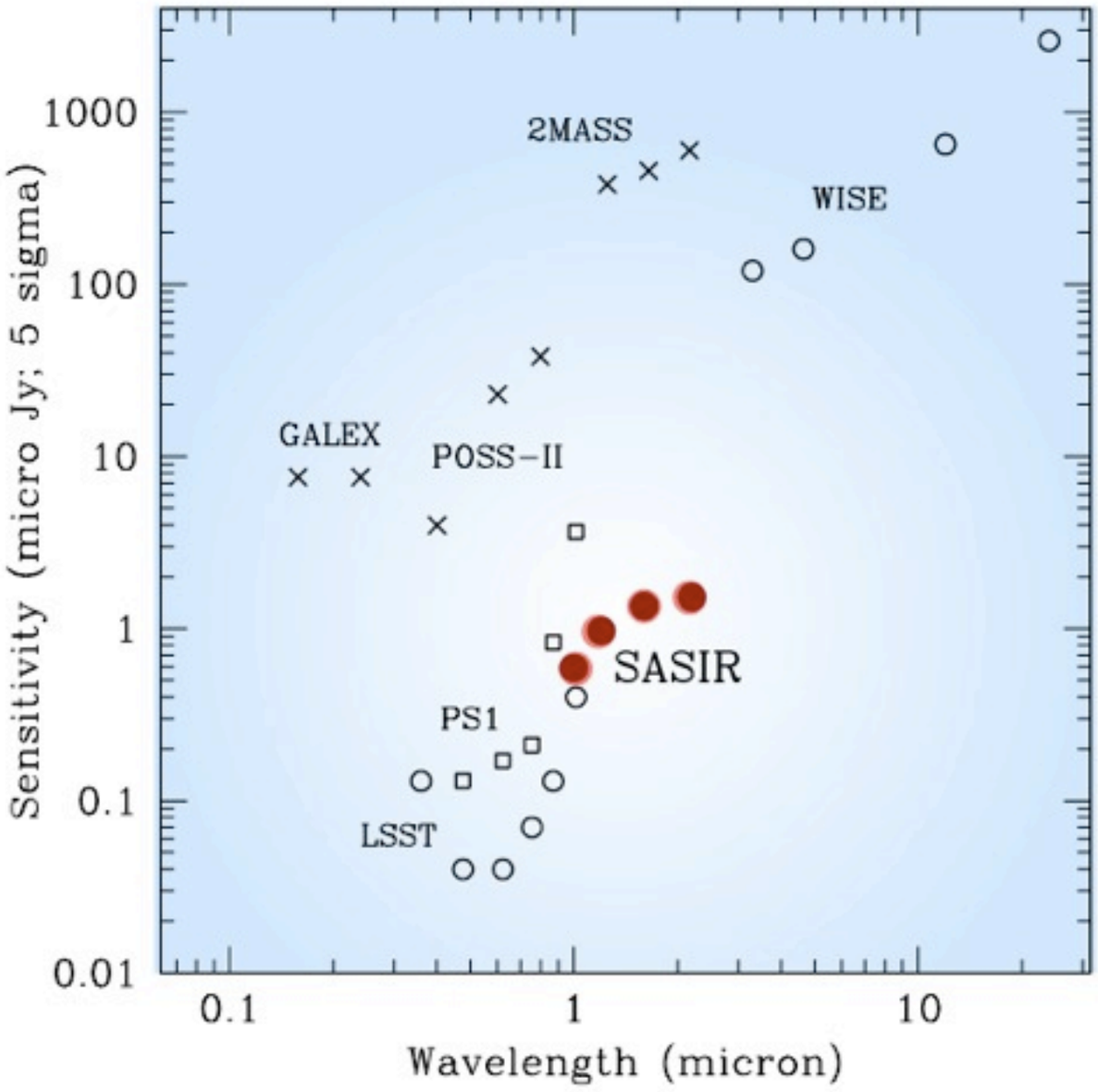


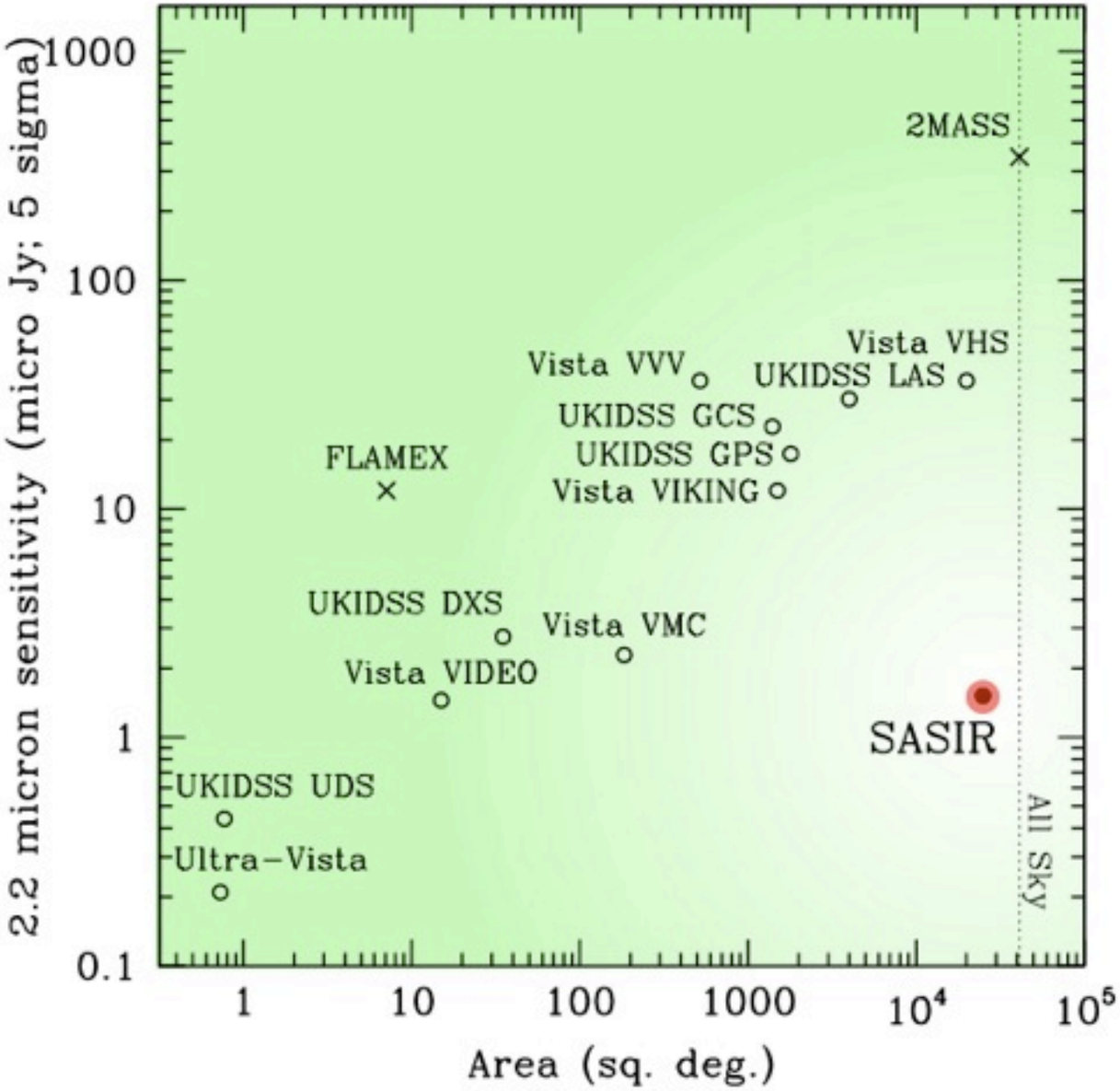
Díaz & Lee 10



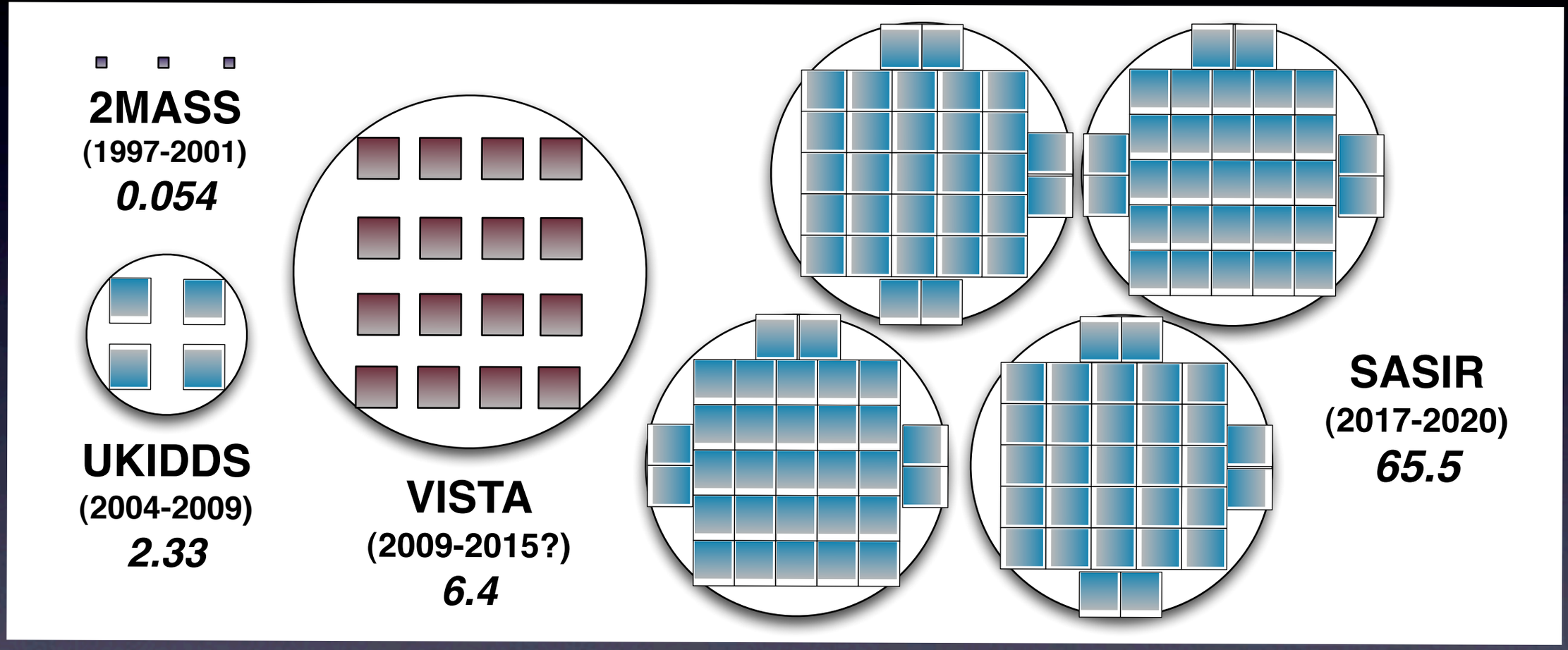
MacFadyen & Milosavljevic 08

Sensitivity





Etendue-couleur



Bands x aperture x field of view

Limiting magnitudes

Filter	5 sigma limiting mag [AB]	flux density µJy
J	18.13	202
H	17.63	320
Ks	17.55	346

2MASS

5 sigma limiting mag [AB]	flux density µJy
22.54	3.5
22.04	5.5
21.95	6.0

SASIR/single epoch

5 sigma limiting mag [AB]	flux density µJy
23.89	1.0
23.39	1.6
23.30	1.7

SASIR/shallow

Limiting magnitudes

Filter	5 sigma limiting mag [AB]	flux density μJy
J	18.13	202
H	17.63	320
Ks	17.55	346

2MASS

5 sigma limiting mag [AB]	flux density μJy
22.54	3.5
22.04	5.5
21.95	6.0

SASIR/single epoch

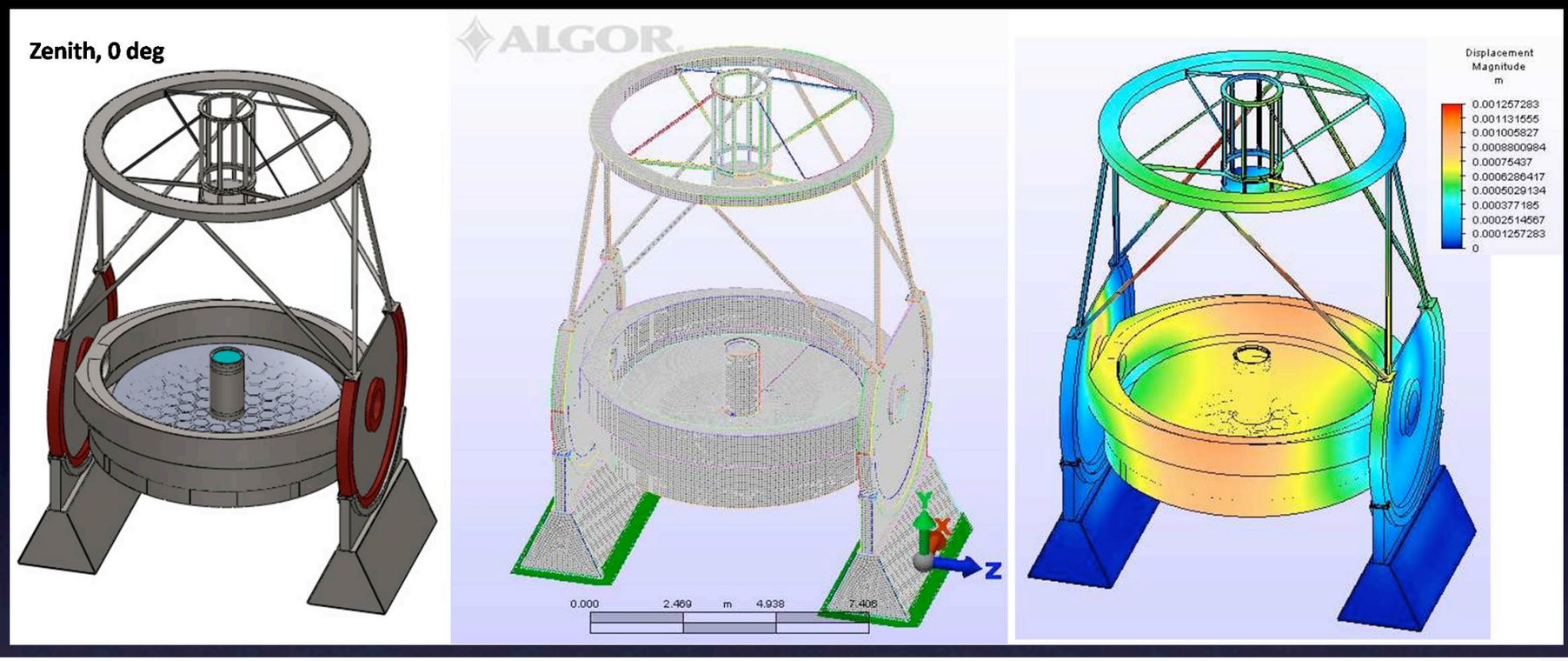
5 sigma limiting mag [AB]	flux density μJy
23.89	1.0
23.39	1.6
23.30	1.7

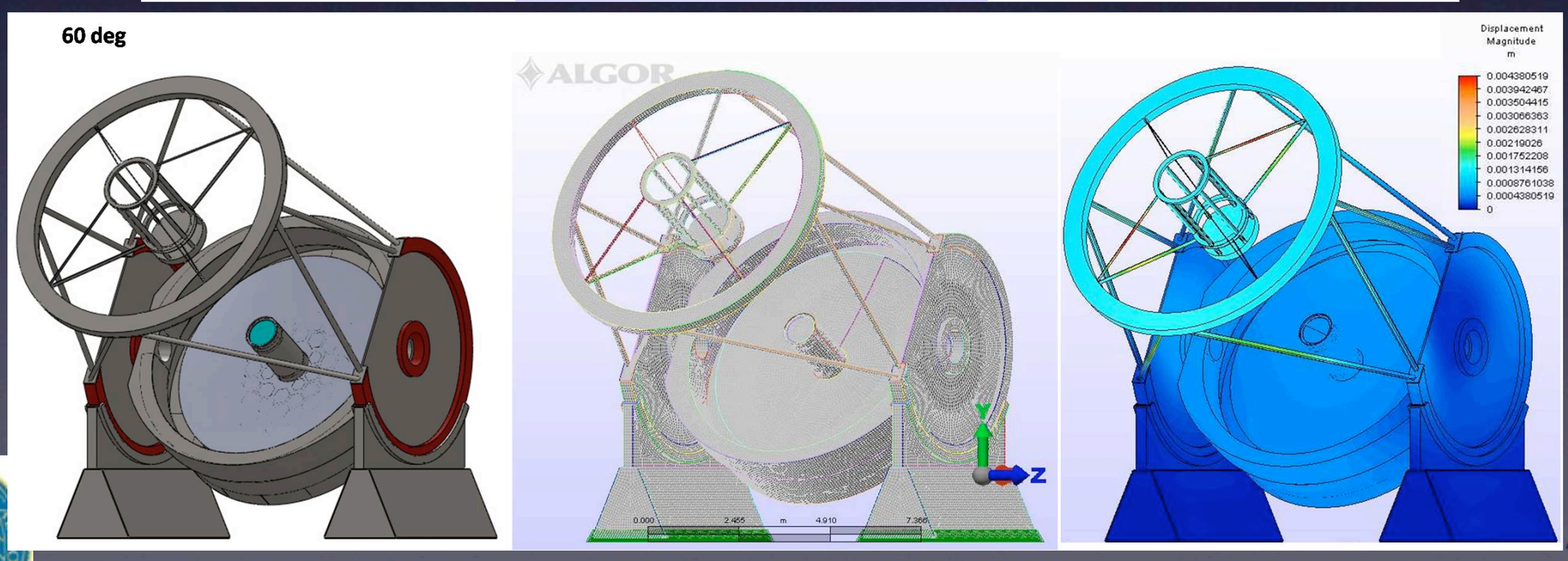
SASIR/shallow

Extended Source Sensitivity ("shallow")

Filter	5 sigma limiting mag [AB arcsec^{-2}]	flux density μJy arcsec^{-2}
Y	23.32	1.7
J	22.78	2.8
H	22.42	3.8
Ks	22.29	4.4

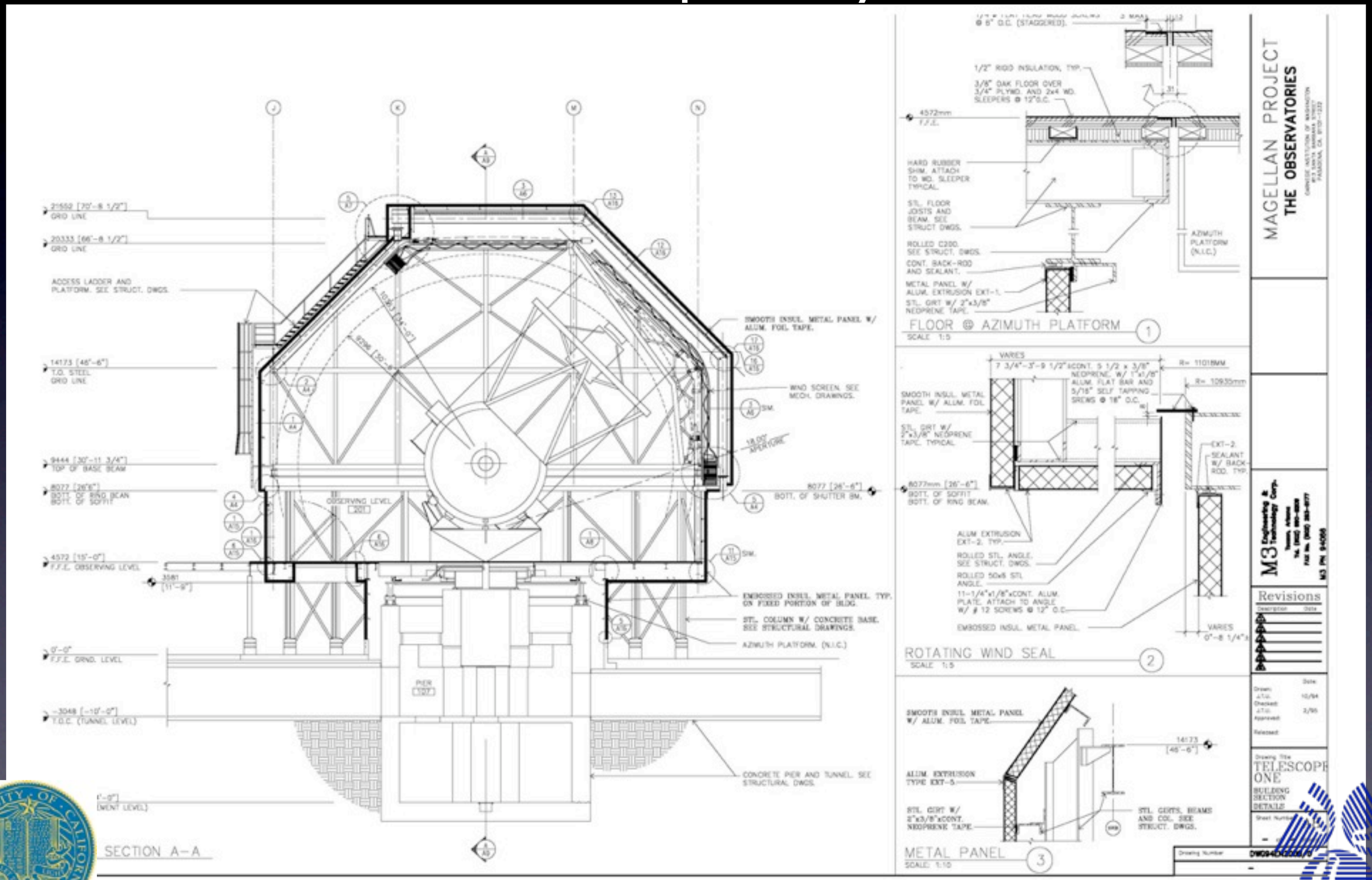
SASIR telescope study work





Spaleniak++10

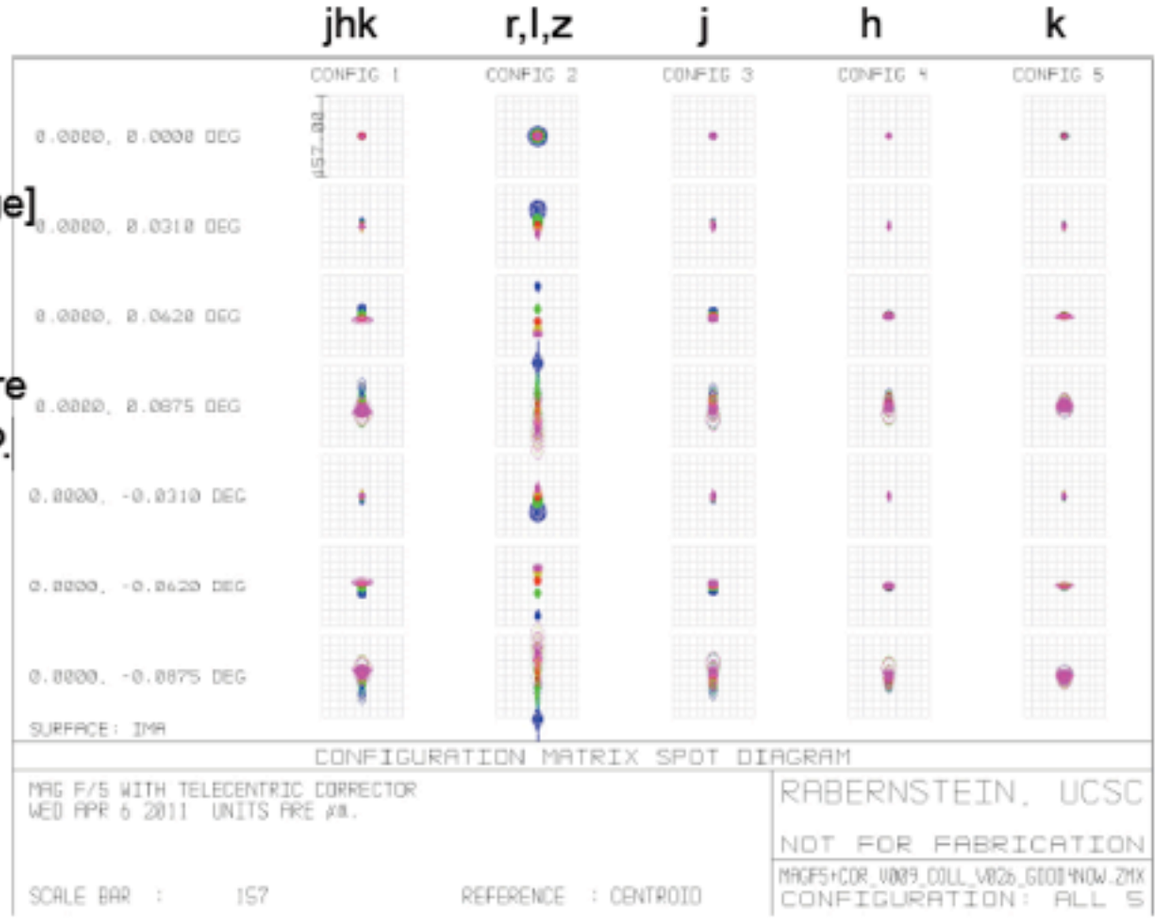
SASIR telescope study work

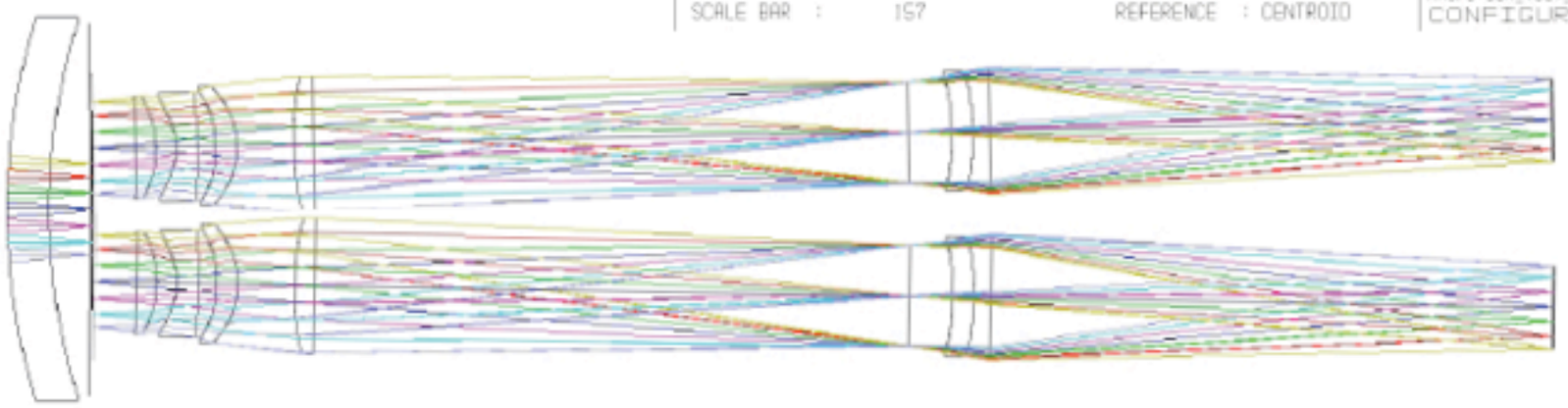


SASIR optical design

Not close to final:

1. Have other materials to use. ($$ on table)
2. Aspheres ($$ on table) [note images at edge]
3. Dichroic / lens geometry solution
   a. reduce lens diameters — dichroic after
   b. push back larger lenses — dichroic before
   c. push back larger lenses — dichroic at FP.





Why this Mexico/US partnership?

Why this Mexico/US partnership?

- There is a considerable list of collaboration between the current partners.

Why this Mexico/US partnership?

- There is a considerable list of collaboration between the current partners.
- Excellent personal, scientific and institutional relations.

Why this Mexico/US partnership?

- There is a considerable list of collaboration between the current partners.
- Excellent personal, scientific and institutional relations.
- Clearly important reasons beyond science (economical, social, cultural, regional...).

Why this Mexico/US partnership?

- There is a considerable list of collaboration between the current partners.
- Excellent personal, scientific and institutional relations.
- Clearly important reasons beyond science (economical, social, cultural, regional...).
- There is a unique potential for funding opportunities given the composition of the collaboration.

Why this Mexico/US partnership?

- There is a considerable list of collaboration between the current partners.
- Excellent personal, scientific and institutional relations.
- Clearly important reasons beyond science (economical, social, cultural, regional...).
- There is a unique potential for funding opportunities given the composition of the collaboration.

Open to further participation

Why this Mexico/US partnership?


LBT


Magellan


TMT


Keck

Why this Mexico/US partnership?

Partners have experience with astronomical projects with large telescopes.


LBT


Magellan

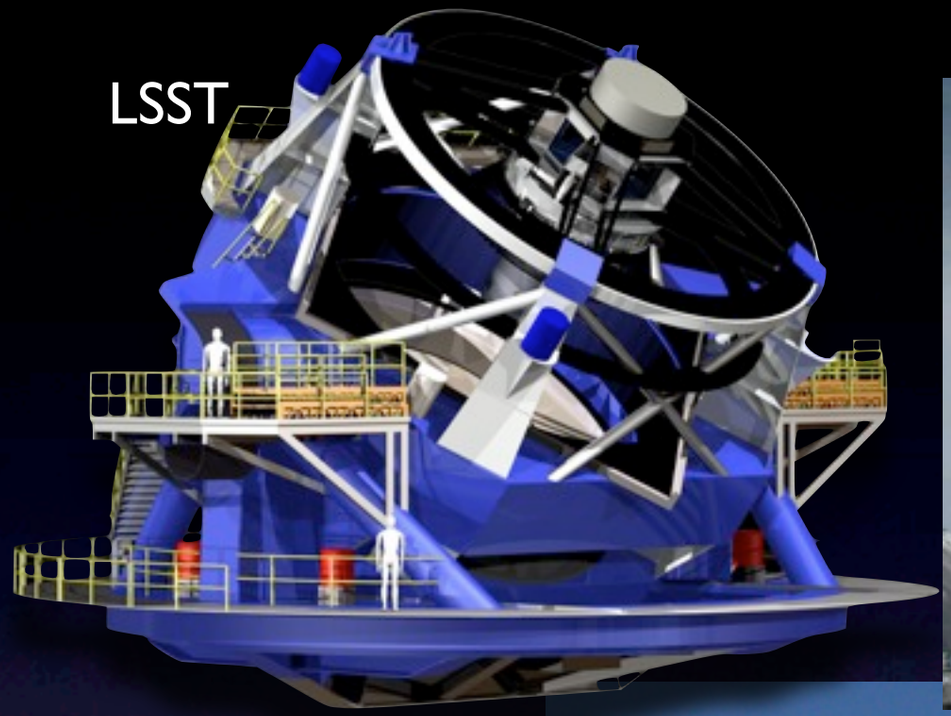

TMT


Keck

Existing synergies with planned and future facilities

GTC

LSST



LMT

ALMA

HAWC

EVLA

Follow-up

-Bi-lateral science working groups will access facilities available to partners.

Survey cadence definition

-To be defined

-Will be fixed according to science priorities.

Outlook and financing

	Total	Cash Flow (year 1 to 15) Millions of USD (FY2009)													
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
PRECONCEPT AND FEASIBILITY STUDY	0.25	0.25														
PROJECT DESIGN & ESTABLISHMENT	0.30	0.03	0.12													
SCIENCE	0.20	0.10	0.05	0.05												
MANAGEMENT	1.80	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24							
SYSTEM ENGINEERING	0.85	0.05	0.10	0.15	0.10	0.15	0.10	0.10	0.10							
CIVIL ENGINEERING (Dome & Building)	19.45		0.90	2.65	4.40	5.55	4.23	1.48	0.24							
TEL. MECHANICS (Design, Construction, Integration)	10.39	0.05	0.68	0.28	2.19	2.95	1.93	0.88	1.45							
TEL. & WFC OPTICS (Design, Manufacture, Integration)	21.55	0.26	1.52	0.35	2.90	4.65	5.84	4.83	1.21							
COATING & AUXILIARY SERVICES	5.00				0.75	2.00	1.50	0.50	0.25							
TELESCOPE CONTROL SYSTEM	2.35		0.08	0.18	0.33	0.43	0.65	0.48	0.23							
SASIR CAMERA (Design, Manufacture, Integration)	50.23	0.08	0.15	0.73	5.53	7.85	10.00	9.65	16.25							
SASIR SURVEY	28.15								1.28	4.77	4.72	4.77	4.72	4.77	1.63	1.53
WFST (2nd-Phase Instrumentation)	29.18								0.86	6.10	5.49	4.98	5.23	5.23	1.31	
TOTAL 15-yr PROJECT	169.70	0.93	3.86	4.75	16.43	23.82	24.49	18.15	22.09	10.87	10.20	9.74	9.94	9.99	2.93	1.53
Contingency (15%)	25.45	0.14	0.58	0.71	2.46	3.57	3.67	2.72	3.31	1.63	1.53	1.46	1.49	1.50	0.44	0.23
TOTAL with 15% Contingency	195.15	1.07	4.44	5.46	18.89	27.39	28.16	20.87	25.40	12.50	11.73	11.20	11.43	11.49	3.37	1.75
Project Phase		PROJECT DEFINITION			PROJECT CONSTRUCTION					SCIENCE OPERATIONS (& 2nd-Phase Instr)						
Financial Sources:		NSF, CONACyT & UC, UNAM, INAOE			Private, Federal & Partner Univs.					Federal, Private & Partnership Institutions						

Outlook and financing

- Low-risk project, based on proven Magellan concept.

	Total	Cash Flow (year 1 to 15) Millions of USD (FY2009)													
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
PRECONCEPT AND FEASIBILITY STUDY	0.25	0.25														
PROJECT DESIGN & ESTABLISHMENT	0.30	0.03	0.12													
SCIENCE	0.20	0.10	0.05	0.05												
MANAGEMENT	1.80	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24							
SYSTEM ENGINEERING	0.85	0.05	0.10	0.15	0.10	0.15	0.10	0.10	0.10							
CIVIL ENGINEERING (Dome & Building)	19.45		0.90	2.65	4.40	5.55	4.23	1.48	0.24							
TEL. MECHANICS (Design, Construction, Integration)	10.39	0.05	0.68	0.28	2.19	2.95	1.93	0.88	1.45							
TEL. & WFC OPTICS (Design, Manufacture, Integration)	21.55	0.26	1.52	0.35	2.90	4.65	5.84	4.83	1.21							
COATING & AUXILIARY SERVICES	5.00				0.75	2.00	1.50	0.50	0.25							
TELESCOPE CONTROL SYSTEM	2.35		0.08	0.18	0.33	0.43	0.65	0.48	0.23							
SASIR CAMERA (Design, Manufacture, Integration)	50.23	0.08	0.15	0.73	5.53	7.85	10.00	9.65	16.25							
SASIR SURVEY	28.15								1.28	4.77	4.72	4.77	4.72	4.77	1.63	1.53
WFST (2nd-Phase Instrumentation)	29.18								0.86	6.10	5.49	4.98	5.23	5.23	1.31	
TOTAL 15-yr PROJECT	169.70	0.93	3.86	4.75	16.43	23.82	24.49	18.15	22.09	10.87	10.20	9.74	9.94	9.99	2.93	1.53
Contingency (15%)	25.45	0.14	0.58	0.71	2.46	3.57	3.67	2.72	3.31	1.63	1.53	1.46	1.49	1.50	0.44	0.23
TOTAL with 15% Contingency	195.15	1.07	4.44	5.46	18.89	27.39	28.16	20.87	25.40	12.50	11.73	11.20	11.43	11.49	3.37	1.75
Project Phase		PROJECT DEFINITION			PROJECT CONSTRUCTION					SCIENCE OPERATIONS (& 2nd-Phase Instr)						
Financial Sources:		NSF, CONACyT & UC, UNAM, INAOE			Private, Federal & Partner Univs.					Federal, Private & Partnership Institutions						

Outlook and financing

- Low-risk project, based on proven Magellan concept.
- Mixed private/public funding profile.

	Total	Cash Flow (year 1 to 15) Millions of USD (FY2009)													
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
PRECONCEPT AND FEASIBILITY STUDY	0.25	0.25														
PROJECT DESIGN & ESTABLISHMENT	0.30	0.03	0.12													
SCIENCE	0.20	0.10	0.05	0.05												
MANAGEMENT	1.80	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24							
SYSTEM ENGINEERING	0.85	0.05	0.10	0.15	0.10	0.15	0.10	0.10	0.10							
CIVIL ENGINEERING (Dome & Building)	19.45		0.90	2.65	4.40	5.55	4.23	1.48	0.24							
TEL. MECHANICS (Design, Construction, Integration)	10.39	0.05	0.68	0.28	2.19	2.95	1.93	0.88	1.45							
TEL. & WFC OPTICS (Design, Manufacture, Integration)	21.55	0.26	1.52	0.35	2.90	4.65	5.84	4.83	1.21							
COATING & AUXILIARY SERVICES	5.00				0.75	2.00	1.50	0.50	0.25							
TELESCOPE CONTROL SYSTEM	2.35		0.08	0.18	0.33	0.43	0.65	0.48	0.23							
SASIR CAMERA (Design, Manufacture, Integration)	50.23	0.08	0.15	0.73	5.53	7.85	10.00	9.65	16.25							
SASIR SURVEY	28.15								1.28	4.77	4.72	4.77	4.72	4.77	1.63	1.53
WFST (2nd-Phase Instrumentation)	29.18								0.86	6.10	5.49	4.98	5.23	5.23	1.31	
TOTAL 15-yr PROJECT	169.70	0.93	3.86	4.75	16.43	23.82	24.49	18.15	22.09	10.87	10.20	9.74	9.94	9.99	2.93	1.53
Contingency (15%)	25.45	0.14	0.58	0.71	2.46	3.57	3.67	2.72	3.31	1.63	1.53	1.46	1.49	1.50	0.44	0.23
TOTAL with 15% Contingency	195.15	1.07	4.44	5.46	18.89	27.39	28.16	20.87	25.40	12.50	11.73	11.20	11.43	11.49	3.37	1.75
Project Phase		PROJECT DEFINITION			PROJECT CONSTRUCTION					SCIENCE OPERATIONS (& 2nd-Phase Instr)						
Financial Sources:		NSF, CONACyT & UC, UNAM, INAOE			Private, Federal & Partner Univs.					Federal, Private & Partnership Institutions						

Outlook and financing

- Low-risk project, based on proven Magellan concept.
- Mixed private/public funding profile.
- Public: conceptual design funds.

	Total	Cash Flow (year 1 to 15) Millions of USD (FY2009)													
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
PRECONCEPT AND FEASIBILITY STUDY	0.25	0.25														
PROJECT DESIGN & ESTABLISHMENT	0.30	0.03	0.12													
SCIENCE	0.20	0.10	0.05	0.05												
MANAGEMENT	1.80	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24							
SYSTEM ENGINEERING	0.85	0.05	0.10	0.15	0.10	0.15	0.10	0.10	0.10							
CIVIL ENGINEERING (Dome & Building)	19.45		0.90	2.65	4.40	5.55	4.23	1.48	0.24							
TEL. MECHANICS (Design, Construction, Integration)	10.39	0.05	0.68	0.28	2.19	2.95	1.93	0.88	1.45							
TEL. & WFC OPTICS (Design, Manufacture, Integration)	21.55	0.26	1.52	0.35	2.90	4.65	5.84	4.83	1.21							
COATING & AUXILIARY SERVICES	5.00				0.75	2.00	1.50	0.50	0.25							
TELESCOPE CONTROL SYSTEM	2.35		0.08	0.18	0.33	0.43	0.65	0.48	0.23							
SASIR CAMERA (Design, Manufacture, Integration)	50.23	0.08	0.15	0.73	5.53	7.85	10.00	9.65	16.25							
SASIR SURVEY	28.15								1.28	4.77	4.72	4.77	4.72	4.77	1.63	1.53
WFST (2nd-Phase Instrumentation)	29.18								0.86	6.10	5.49	4.98	5.23	5.23	1.31	
TOTAL 15-yr PROJECT	169.70	0.93	3.86	4.75	16.43	23.82	24.49	18.15	22.09	10.87	10.20	9.74	9.94	9.99	2.93	1.53
Contingency (15%)	25.45	0.14	0.58	0.71	2.46	3.57	3.67	2.72	3.31	1.63	1.53	1.46	1.49	1.50	0.44	0.23
TOTAL with 15% Contingency	195.15	1.07	4.44	5.46	18.89	27.39	28.16	20.87	25.40	12.50	11.73	11.20	11.43	11.49	3.37	1.75
Project Phase		PROJECT DEFINITION			PROJECT CONSTRUCTION					SCIENCE OPERATIONS (& 2nd-Phase Instr)						
Financial Sources:		NSF, CONACyT & UC, UNAM, INAOE			Private, Federal & Partner Univs.					Federal, Private & Partnership Institutions						

Outlook and financing

- Low-risk project, based on proven Magellan concept.
- Mixed private/public funding profile.
- Public: conceptual design funds.
- Private/combined: construction, operation, 2nd phase.

	Total	Cash Flow (year 1 to 15) Millions of USD (FY2009)													
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
PRECONCEPT AND FEASIBILITY STUDY	0.25	0.25														
PROJECT DESIGN & ESTABLISHMENT	0.30	0.03	0.12													
SCIENCE	0.20	0.10	0.05	0.05												
MANAGEMENT	1.80	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24							
SYSTEM ENGINEERING	0.85	0.05	0.10	0.15	0.10	0.15	0.10	0.10	0.10							
CIVIL ENGINEERING (Dome & Building)	19.45		0.90	2.65	4.40	5.55	4.23	1.48	0.24							
TEL. MECHANICS (Design, Construction, Integration)	10.39	0.05	0.68	0.28	2.19	2.95	1.93	0.88	1.45							
TEL. & WFC OPTICS (Design, Manufacture, Integration)	21.55	0.26	1.52	0.35	2.90	4.65	5.84	4.83	1.21							
COATING & AUXILIARY SERVICES	5.00				0.75	2.00	1.50	0.50	0.25							
TELESCOPE CONTROL SYSTEM	2.35		0.08	0.18	0.33	0.43	0.65	0.48	0.23							
SASIR CAMERA (Design, Manufacture, Integration)	50.23	0.08	0.15	0.73	5.53	7.85	10.00	9.65	16.25							
SASIR SURVEY	28.15								1.28	4.77	4.72	4.77	4.72	4.77	1.63	1.53
WFST (2nd-Phase Instrumentation)	29.18								0.86	6.10	5.49	4.98	5.23	5.23	1.31	
TOTAL 15-yr PROJECT	169.70	0.93	3.86	4.75	16.43	23.82	24.49	18.15	22.09	10.87	10.20	9.74	9.94	9.99	2.93	1.53
Contingency (15%)	25.45	0.14	0.58	0.71	2.46	3.57	3.67	2.72	3.31	1.63	1.53	1.46	1.49	1.50	0.44	0.23
TOTAL with 15% Contingency	195.15	1.07	4.44	5.46	18.89	27.39	28.16	20.87	25.40	12.50	11.73	11.20	11.43	11.49	3.37	1.75
Project Phase		PROJECT DEFINITION			PROJECT CONSTRUCTION					SCIENCE OPERATIONS (& 2nd-Phase Instr)						
Financial Sources:		NSF, CONACyT & UC, UNAM, INAOE			Private, Federal & Partner Univs.					Federal, Private & Partnership Institutions						

Outlook and financing

- Low-risk project, based on proven Magellan concept.
- Mixed private/public funding profile.
- Public: conceptual design funds.
- Private/combined: construction, operation, 2nd phase.
- Total investment at ~190 MUSD, including operations, 2nd phase and contingency.

	Total	Cash Flow (year 1 to 15) Millions of USD (FY2009)													
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
PRECONCEPT AND FEASIBILITY STUDY	0.25	0.25														
PROJECT DESIGN & ESTABLISHMENT	0.30	0.03	0.12													
SCIENCE	0.20	0.10	0.05	0.05												
MANAGEMENT	1.80	0.12	0.24	0.24	0.24	0.24	0.24	0.24	0.24							
SYSTEM ENGINEERING	0.85	0.05	0.10	0.15	0.10	0.15	0.10	0.10	0.10							
CIVIL ENGINEERING (Dome & Building)	19.45		0.90	2.65	4.40	5.55	4.23	1.48	0.24							
TEL. MECHANICS (Design, Construction, Integration)	10.39	0.05	0.68	0.28	2.19	2.95	1.93	0.88	1.45							
TEL. & WFC OPTICS (Design, Manufacture, Integration)	21.55	0.26	1.52	0.35	2.90	4.65	5.84	4.83	1.21							
COATING & AUXILIARY SERVICES	5.00				0.75	2.00	1.50	0.50	0.25							
TELESCOPE CONTROL SYSTEM	2.35		0.08	0.18	0.33	0.43	0.65	0.48	0.23							
SASIR CAMERA (Design, Manufacture, Integration)	50.23	0.08	0.15	0.73	5.53	7.85	10.00	9.65	16.25							
SASIR SURVEY	28.15								1.28	4.77	4.72	4.77	4.72	4.77	1.63	1.53
WFST (2nd-Phase Instrumentation)	29.18								0.86	6.10	5.49	4.98	5.23	5.23	1.31	
TOTAL 15-yr PROJECT	169.70	0.93	3.86	4.75	16.43	23.82	24.49	18.15	22.09	10.87	10.20	9.74	9.94	9.99	2.93	1.53
Contingency (15%)	25.45	0.14	0.58	0.71	2.46	3.57	3.67	2.72	3.31	1.63	1.53	1.46	1.49	1.50	0.44	0.23
TOTAL with 15% Contingency	195.15	1.07	4.44	5.46	18.89	27.39	28.16	20.87	25.40	12.50	11.73	11.20	11.43	11.49	3.37	1.75
Project Phase		PROJECT DEFINITION			PROJECT CONSTRUCTION					SCIENCE OPERATIONS (& 2nd-Phase Instr)						
Financial Sources:		NSF, CONACyT & UC, UNAM, INAOE			Private, Federal & Partner Univs.					Federal, Private & Partnership Institutions						

SASIR/SPMT: Where are we now?

Brief selective history

Brief selective history

- Started end 2007/beginning 2008

Brief selective history

- Started end 2007/beginning 2008
- Guillermo Haro workshop at INAOE in august 2008.

Brief selective history

- Started end 2007/beginning 2008
- Guillermo Haro workshop at INAOE in august 2008.
- Considerations for the "Decadal Survey Astro2010" in the US in 2009.

Brief selective history

- Started end 2007/beginning 2008
- Guillermo Haro workshop at INAOE in august 2008.
- Considerations for the "Decadal Survey Astro2010" in the US in 2009.
- 6.5m casting at the UA in august in november 2009.

Brief selective history

- Started end 2007/beginning 2008
- Guillermo Haro workshop at INAOE in august 2008.
- Considerations for the "Decadal Survey Astro2010" in the US in 2009.
- 6.5m casting at the UA in august in november 2009.
- Primary mirror fully funded (INAOE/UA).

Brief selective history

- Started end 2007/beginning 2008
- Guillermo Haro workshop at INAOE in august 2008.
- Considerations for the "Decadal Survey Astro2010" in the US in 2009.
- 6.5m casting at the UA in august in november 2009.
- Primary mirror fully funded (INAOE/UA).
- Project office for OAN/SPM opened in september 2009.

Brief selective history

- Started end 2007/beginning 2008
- Guillermo Haro workshop at INAOE in august 2008.
- Considerations for the "Decadal Survey Astro2010" in the US in 2009.
- 6.5m casting at the UA in august in november 2009.
- Primary mirror fully funded (INAOE/UA).
- Project office for OAN/SPM opened in september 2009.
- SASIR workshops at LBNL in april 2010, 2011

Brief selective history

ng 2008

o at INAOE in august 2008.

Decadal Survey Astro2010"

august in november 2009.

ed (INAOE/UA).

PM opened in september

L in april 2010, 2011

Brief selective history

g 2008

SASIR proposals summary

SASIR proposals summary

- CONACyT Basic Science, approved 2009.

SASIR proposals summary

- CONACyT Basic Science, approved 2009.
- Science case development, telescope conceptual design, survey strategies, exchange.

SASIR proposals summary

- CONACyT Basic Science, approved 2009.
- Science case development, telescope conceptual design, survey strategies, exchange.
- National Science Foundation, submitted 2009, 2010.

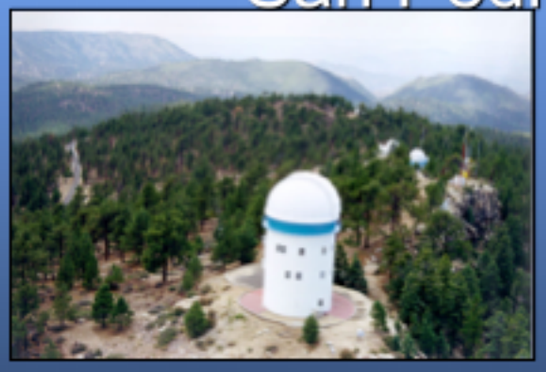
SASIR proposals summary

- CONACyT Basic Science, approved 2009.
- Science case development, telescope conceptual design, survey strategies, exchange.

- National Science Foundation, submitted 2009, 2010.
- Science case development, camera design, survey strategies, exchange.

The site at OAN-SPM

San Pedro Mártir Site



Developed & operated as observatory by IA-UNAM over the last 35 yrs

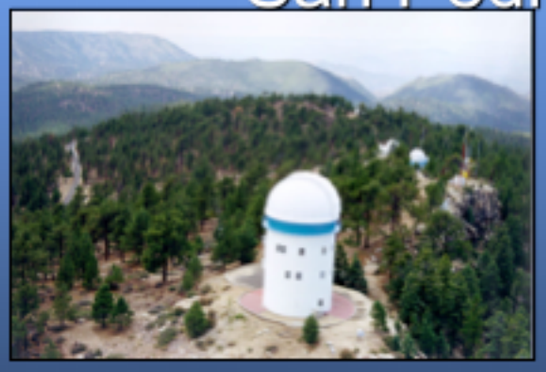
OAN 127 yrs:
Chapultepec (1878) -> Tacubaya (1909)
Tonanzintla (1942) -> SPM (1967)

3 main telescopes (2.1m, 1.5m, & 0.84m)

Well equipped with a good battery of instruments (Optical to 25 μm)

The site at OAN-SPM

San Pedro Mártir Site

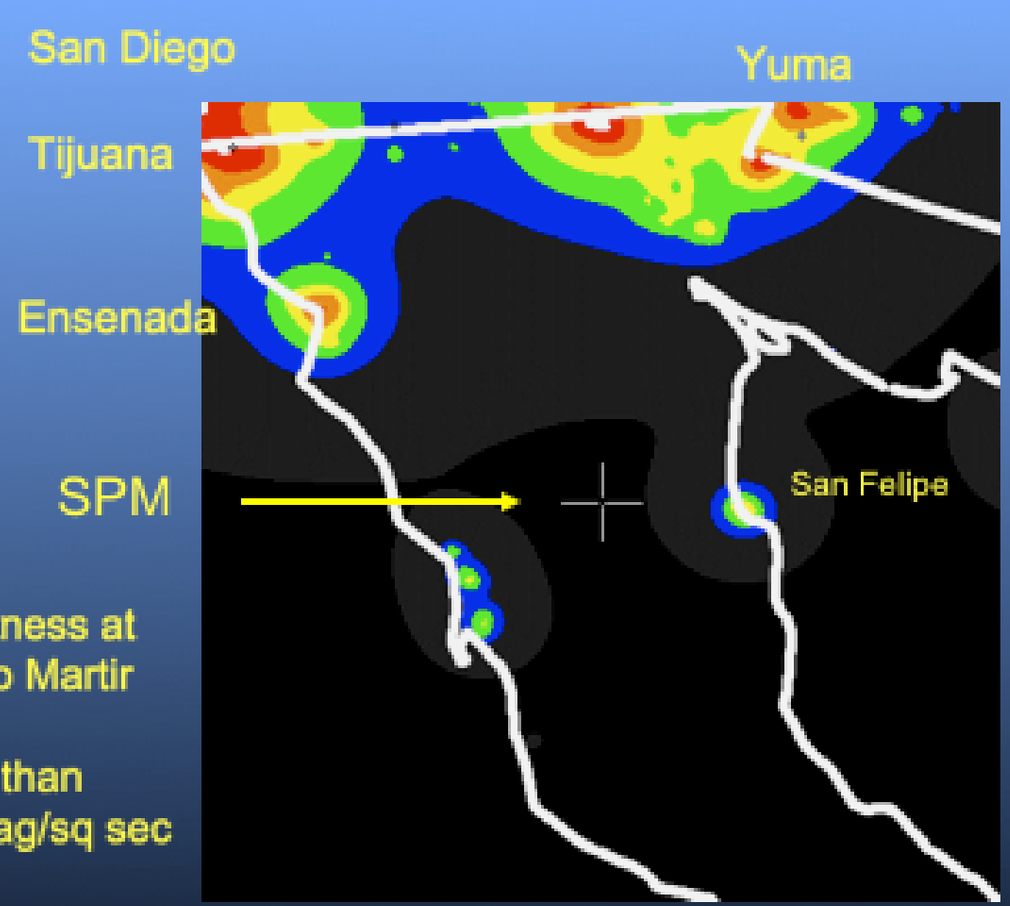


Developed & operated as observatory by IA-UNAM over the last 35 yrs

OAN 127 yrs:
Chapultepec (1878) -> Tacubaya (1909)
Tonanzintla (1942) -> SPM (1967)

3 main telescopes (2.1m, 1.5m, & 0.84m)

Well equipped with a good battery of instruments (Optical to 25 μm)

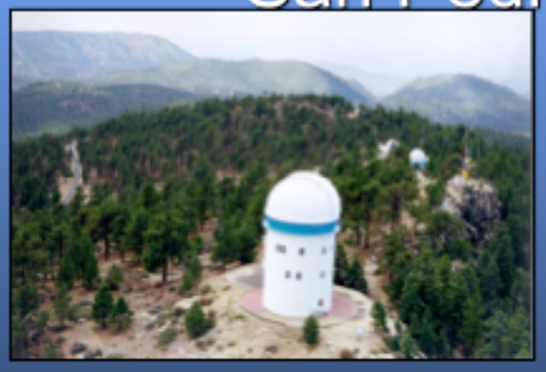


Sky Brightness at San Pedro Martir

Darker than B ~ 22.3 mag/sq sec

The site at OAN-SPM

San Pedro Mártir Site



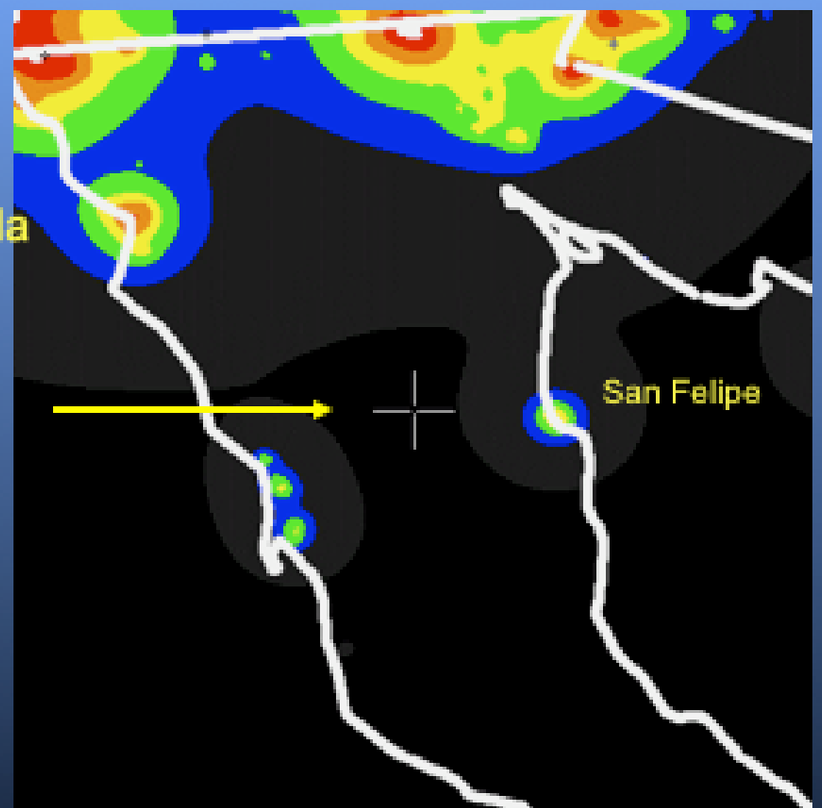
Developed & operated as observatory by IA-UNAM over the last 35 yrs

OAN 127 yrs:
Chapultepec (1878) -> Tacubaya (1909)
Tonanzintla (1942) -> SPM (1967)

3 main telescopes (2.1m, 1.5m, & 0.84m)

Well equipped with a good battery of instruments (Optical to 25 μm)

Site TIM-O1 +31° 02.720′ -115° 28.086′ 2800 m

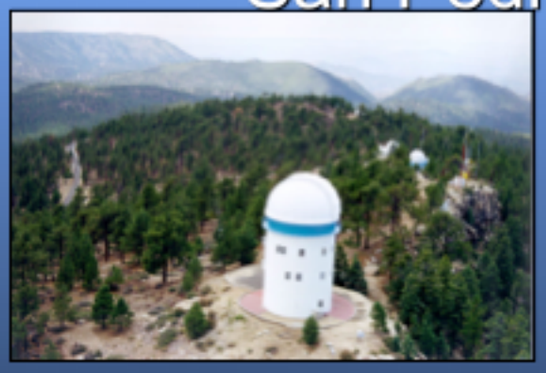


ightness at
edro Martir

ker than
3 mag/sq sec

The site at OAN-SPM

San Pedro Mártir Site



Developed & operated as observatory by IA-UNAM over the last 35 yrs

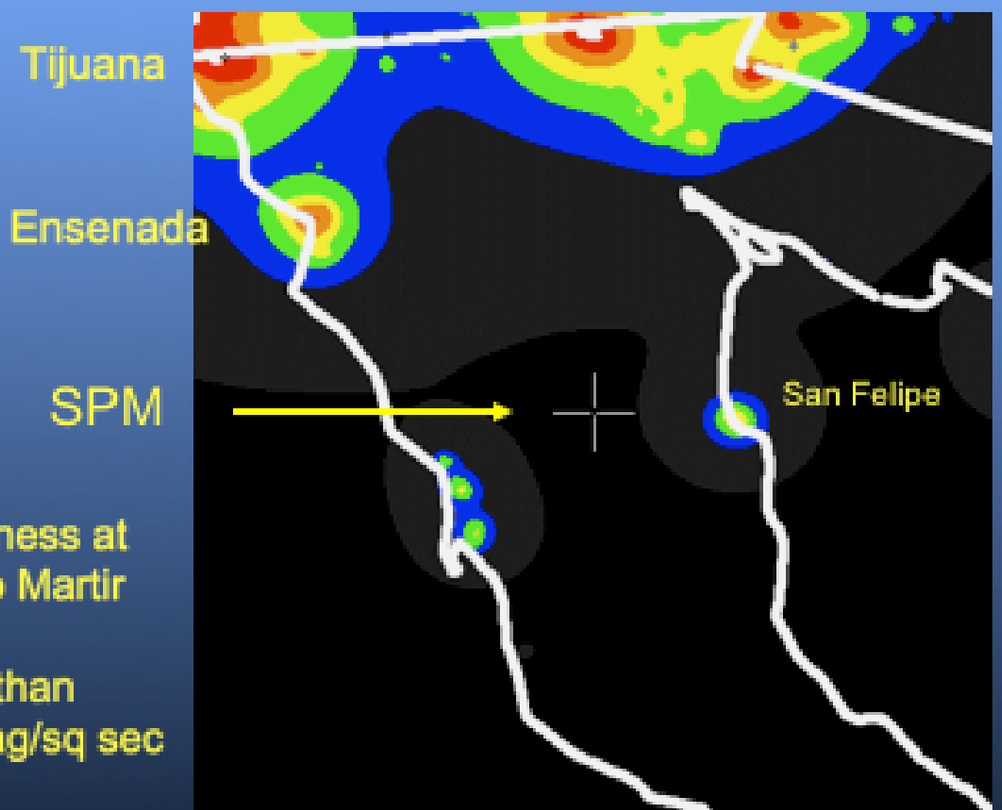
OAN 127 yrs:
Chapultepec (1878) -> Tacubaya (1909)
Tonanzintla (1942) -> SPM (1967)

3 main telescopes (2.1m, 1.5m, & 0.84m)

Well equipped with a good battery of instruments (Optical to 25 μm)

Site TIM-O1 +31° 02.720′ -115° 28.086′ 2800 m

- One of the top sites for optical/ IR astronomy (with Canary Islands, Hawaii, Chile).



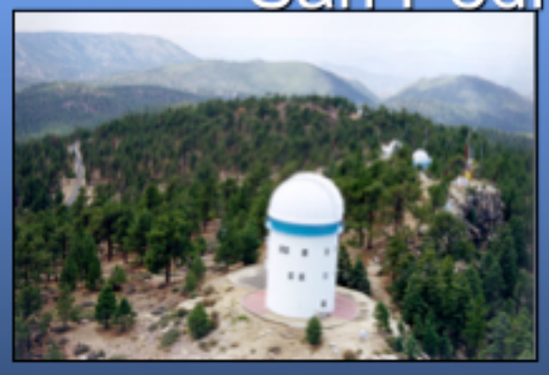
ightness at
edro Martir

ker than
3 mag/sq sec

The site at OAN-SPM

- One of the top sites for optical/ IR astronomy (with Canary Islands, Hawaii, Chile).
- The least developed so far.

San Pedro Mártir Site



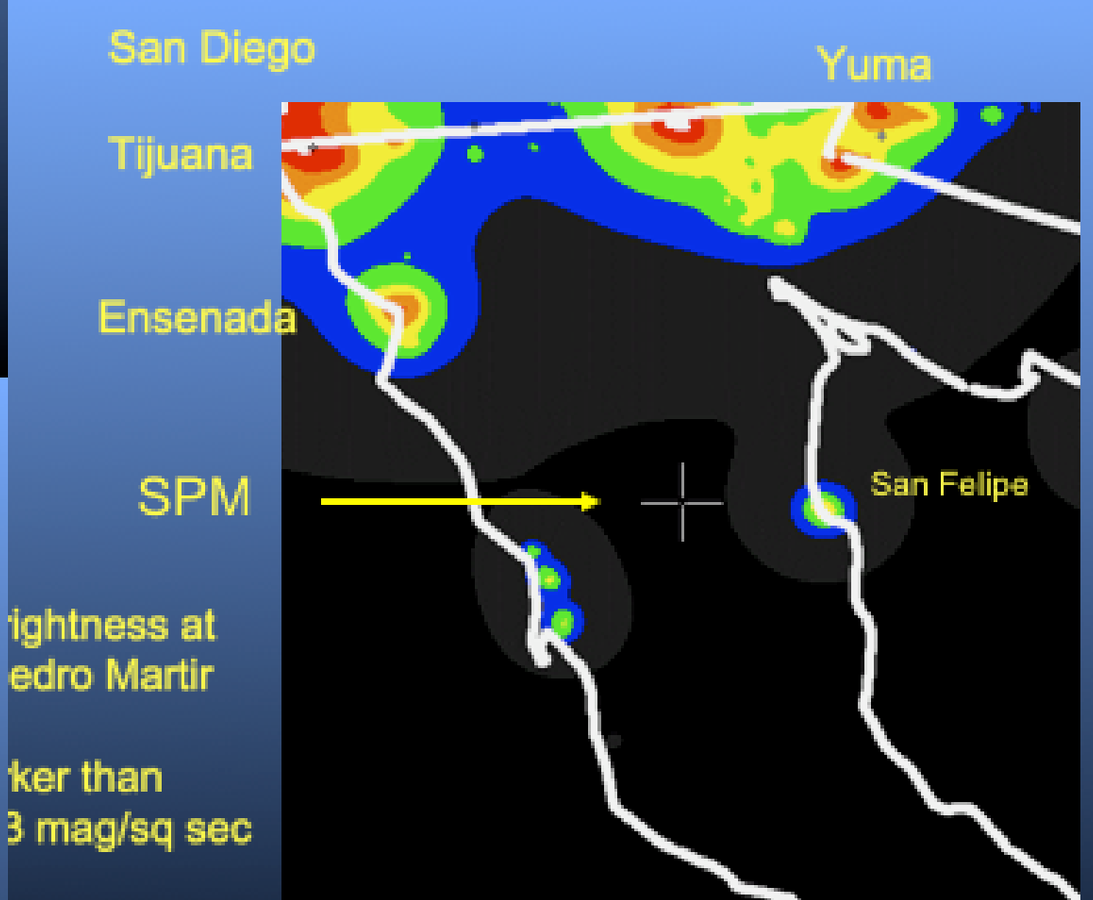
Developed & operated as observatory by IA-UNAM over the last 35 yrs

OAN 127 yrs:
Chapultepec (1878) -> Tacubaya (1909)
Tonanzintla (1942) -> SPM (1967)

3 main telescopes (2.1m, 1.5m, & 0.84m)

Well equipped with a good battery of instruments (Optical to 25 μm)

Site TIM-O1 +31° 02.720′ -115° 28.086′ 2800 m



ightness at
edro Martir

ker than
3 mag/sq sec

The site at OAN-SPM

San Pedro Mártir Site

Developed & operated as observatory by IA-UNAM over the last 35 yrs

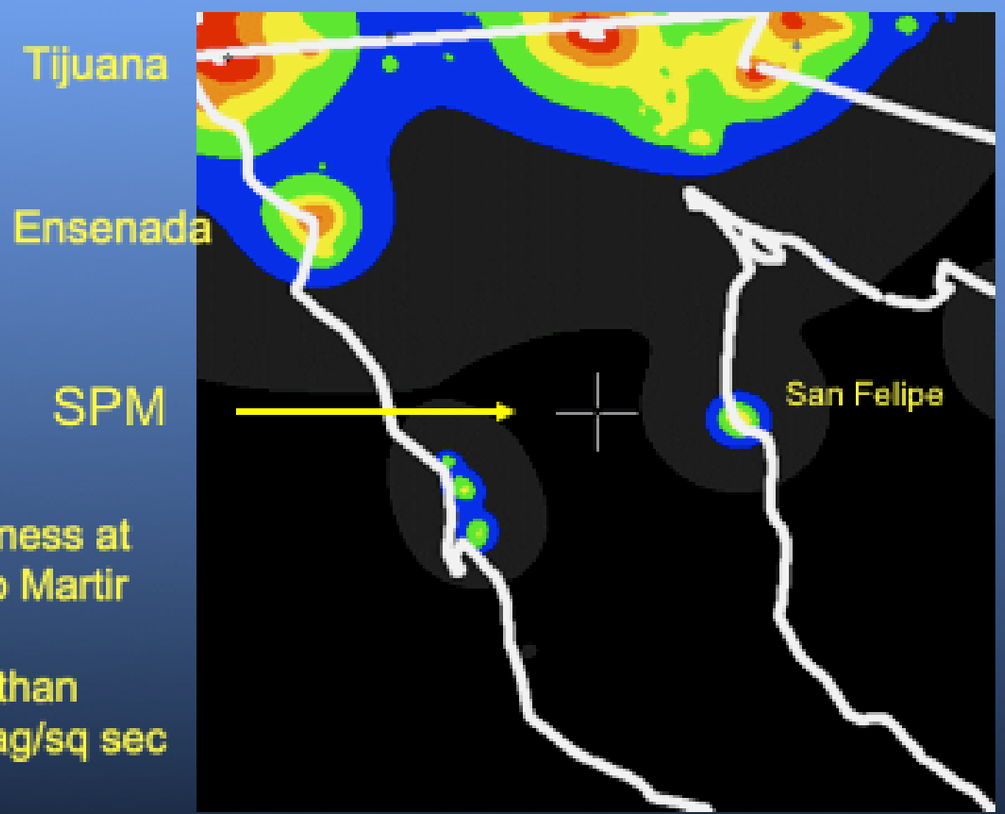
OAN 127 yrs:
Chapultepec (1878) -> Tacubaya (1909)
Tonanzintla (1942) -> SPM (1967)

3 main telescopes (2.1m, 1.5m, & 0.84m)

Well equipped with a good battery of instruments (Optical to 25 μm)

Site TIM-O1 +31° 02.720′ -115° 28.086′ 2800 m

- One of the top sites for optical/ IR astronomy (with Canary Islands, Hawaii, Chile).
- The least developed so far.
- LSST & TMT site testing



ightness at
edro Martir

ker than
3 mag/sq sec

The site at OAN-SPM

- One of the top sites for optical/ IR astronomy (with Canary Islands, Hawaii, Chile).
- The least developed so far.
- LSST & TMT site testing

San Pedro Mártir Site

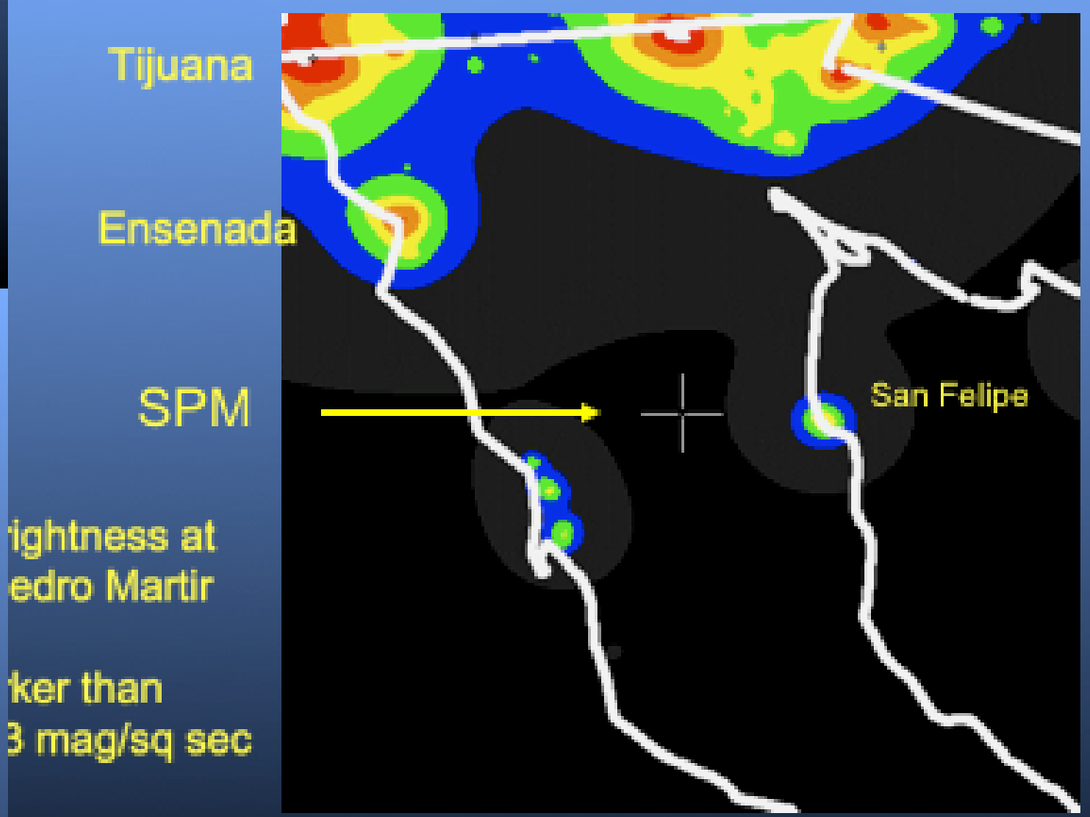
Developed & operated as observatory by IA-UNAM over the last 35 yrs

OAN 127 yrs:
Chapultepec (1878) -> Tacubaya (1909)
Tonanzintla (1942) -> SPM (1967)

3 main telescopes (2.1m, 1.5m, & 0.84m)

Well equipped with a good battery of instruments (Optical to 25 μm)

Site TIM-O1 +31° 02.720′ -115° 28.086′ 2800 m



ightness at
edro Martir

ker than
3 mag/sq sec

Clear, dark, stable, superb seeing

Proposals summary - SASIR and the OAN/SPM

Proposals summary - SASIR and the OAN/SPM

- CONACyT, National Laboratories, approved 2010. Site infrastructure: fiber optic, link to electrical power grid, aluminizing chamber for 6.5m primary.

Proposals summary - SASIR and the OAN/SPM

- CONACyT, National Laboratories, approved 2010. Site infrastructure: fiber optic, link to electrical power grid, aluminizing chamber for 6.5m primary.

- CONACyT, Networks, submitted 2010.

Proposals summary - SASIR and the OAN/SPM

- CONACyT, National Laboratories, approved 2010. Site infrastructure: fiber optic, link to electrical power grid, aluminizing chamber for 6.5m primary.
- CONACyT, Networks, submitted 2010.
- Definition studies for SASIR++, management plan, long term development plan for OAN/SPM, outreach and education.

Projects Office for OAN/SPM

Projects Office for OAN/SPM

- Opened in September 2009 at UNAM in Mexico City.

Projects Office for OAN/SPM

- Opened in September 2009 at UNAM in Mexico City.

- Charged with planning, management, legal, environmental and consortium issues.

Projects Office for OAN/SPM

- Opened in September 2009 at UNAM in Mexico City.

- Charged with planning, management, legal, environmental and consortium issues.

- Currently working on SASIR and other projects at smaller scales.

SASIR is a window of opportunity to:

- carry out high impact research in practically all areas of astronomy and physics,

- feed the ELTs in the NIR

- scientific and technical collaboration between Mexico and the US, including border states,

- development of human resources,

- education and outreach in science and technology.

Thank you