Astronomy/Instrumentation Summer Program Schedule

Time	Sun 07/13	Mon 07/14	Tue 07/15	Wed 07/16	Thu 07/17	Fri 07/18	Sat 07/19	Sun 07/20	Mon 07/21	Tue 07/22	Wed 07/23 [1] — IC/DAQ	Wed 07/23 — Cosmic Rays	Wed 07/23 — Radio Astro	Thu 07/24 — IC/DAQ	Thu 07/24 — Cosmic Rays	Thu 07/24 — Radio Astro	Fri 07/25	Sat 07/26
8:00	Arrival	Arrival	Arrival	Arrival	Arrival	Arrival			Arrival	Arrival	Arrival			Arrival			Arrival	Departure
8:30		Basic Tools	Optics 2	Optics 4 [2]	Optics 5	Optics 6 [3]			Electronics 8 [4]	Electronics 11 [5]	IC/DAQ [6]	Cosmic Rays [7]	Radio Astro [8]	IC/DAQ [9]	Cosmic Rays [10]	Radio Astro [11]	Extra lab time & prep	
9:00		Sampling + aliasing	Imaging System [13]	Radio/Submm/FIR	Spectroscopy	Detecting Exoplanets					Project Lab Hr #1	Project Lab Hr #1 [14]		Project Lab Hr #7	Project Lab Hr #7	Project Lab Hr #7		
9:30		Break	Break	Break	Break	Break			Break	Break	Break			Break			Break	
9:45		Basic Tools	IC/DAQ [15]	Electronics 3 [16]	Electronics 5 [17]	Electronics 6 [18]			Electronics 9 [19]	Electronics 12 [20]	IC/DAQ [21]	Cosmic Rays [22]	Radio Astro [23]	IC/DAQ [24]	Cosmic Rays [25]	Radio Astro [26]	Extra lab time & prep	
10:15		[27]	Basic Python								Project Lab Hr #2	Project Lab Hr #2	Project Lab Hr #2 [28]	Project Lab Hr #8	Project Lab Hr #8	Project Lab Hr #8		
10:45		Break	Break	Break	Break	Break			Break	Break	Break			Break			Break	
11:00		Basic Tools [29]	IC/DAQ3 [30]	IC/DAQ 4 [31]	IC/DAQ 5 [32]	IC/DAQ 6 [33]			Electronics 10 [34]	Photometry [35]	IC/DAQ [36]	Cosmic Rays [37]	Radio Astro [38]	IC/DAQ [39]	Cosmic Rays [40]	Radio Astro [41]	Extra lab time & prep	
11:30			Problem Set [42]	Fourier transform and	Sampling + aliasing	Problem set				Time Domain Ph/S	Project Lab Hr #3	Project Lab Hr #3	Project Lab Hr #3 [43]	Project Lab Hr #9	Project Lab Hr #9	Project Lab Hr #9		
12:00 – 1:00	Arrival	Lunch	Lunch	Lunch	Lunch	Lunch	Personal Time	Personal Time	Lunch	Lunch	Lunch			Lunch			Lunch	
1:30		Optics 1 [44]	Optics 3 [45]	[46]	[47]	Electronics 7 [48]			Radio Astro [49]	Optic w/ Mikio [50]	IC/DAQ [51]	Cosmic Rays [52]	Radio Astro [53]	IC/DAQ [54]	Cosmic Rays [55]	Radio Astro [56]	Presentation	
2:00		Photons, Waves,	Imaging System						RF Analog #2 [57]		Project Lab Hr #4	Project Lab Hr #4	Project Lab Hr #4 [58]	Project Lab Hr #10	Project Lab Hr #10	Project Lab Hr #10		
2:30		Break	Break	Break	Break	Break			Break	Break	Break			Break			Break	
2:45		Electronics 1 [59]	Electronics 2 [60]	Radio Astro [61]	Radio Astro [62]	Photometry [63]			IC/DAQ 7 [64]	Optic w/ Mikio	IC/DAQ [65]	Cosmic Rays [66]	Radio Astro [67]	IC/DAQ [68]	Cosmic Rays [69]	Radio Astro [70]	Presentation	
3:15				Radio Sciences & projects [71]	RF Analog #1 [72]	Planet Transit			Connecting to Hw, File I/O		Project Lab Hr #5	Project Lab Hr #5	Project Lab Hr #5 [73]	Project Lab Hr #11	Project Lab Hr #11	Project Lab Hr #11		
3:45		Break	Break	Break	Break	Break			Break	Break	Break			Break			Break	
4:00		IC/DAQ 1 [74]	IC/DAQ 3 [75]	Photometry/Radio Astro [76]	Photometry [77]	Photometry/Radio Astro. [7]			Radio Astro [79]	IC/DAQ 8 [80]	IC/DAQ [81]	Cosmic Rays [82]	Radio Astro [83]	IC/DAQ [84]	Cosmic Rays [85]	Radio Astro [86]	Presentation	
4:30		Setup/data types	Problem set	Interferometry [87]	Statistical Analysis (	submm (JCMT)			Lab overview [88]	Problem Set	Project Lab Hr #6	Project Lab Hr #6	Project Lab Hr #6 [89]	Project Lab Hr #12	Project Lab Hr #12	Project Lab Hr #12		
5:00	SAGI Colloquium	Personal Time	Personal Time	Personal Time	Personal Time	Personal Time	Personal Time	Personal Time	Personal Time	Personal Time	Personal Time			Personal Time			Personal Time	
5:30																		
6 – 7		Dinner	Dinner	Dinner	Dinner	Dinner			Dinner	Dinner	Dinner			Dinner			Dinner	
8	Banquet																	
9 – 12							QNO telescope Observation (if weather permits)	Satellite tracking with Optical Telescope	Satellite tracking with Optical Telescope		QNO telescope Observation (if weather permits)			Satellite tracking with Optical Telescope				

[1] Each of the three labs can take about 6 students for 2-3 groups setup

[2] Gene Serabyn

Optical Design Considerations in the mm/submm

[3] Gene Serabyn

[4] Silvia

[5] Hien Nguyen

[6] Logan & Sam

[7] Son Cao

[8] Bang Nhan
(session RA-LAB-00)
- Can take 2 groups, or 6 students

[9] Parallel lab (2 groups per project)

[10] Son Cao

[11] Bang Nhan

[12] Hien Nguyen
0. logistics
1. where, how bright and what color?
2. how to do these measurement?

[13] Jack Sayers
Galaxy Clusters - Cosmology, Astrophysics, and the Need for Multi-Probe Observations

[14] - Group teaming up & Lab setup
- Installing software for those struggled

[15] Sam&Chris
Python functions and control flow
problem sets available

[16] Silvia

[17] Silvia

[18] Silvia

[19] Hien Nguyen

[20] Hien Nguyen

[21] Logan & Sam

[22] Son Cao

[23] Bang Nhan
(session RA-LAB-01a)

[24] Parallel lab (3 groups each)
- IC/DAQ - groups with odd number
- RA - groups with even number

[25] Son Cao

[26] Bang Nhan

[27] Hien Nguyen
3. Fourier Series/Transform

[28] Galactic 21-cm lab
- Astropy & Healpy exercises

[29] Hien Nguyen
4. Understanding the data - Statistics and Inferences
Jack Sayers
5. Presenting your work - how to give a talk?

[30] Logan&Sam. Problem sets on basic python of multiple difficulties available

[31] Sam Condon
Lecture on fourier series, fourier transform, and fourier transform properties

[32] Sam
Lecture on sampling, aliasing, and if time permits, the discrete fourier transform

[33] Logan and Sam
Set up file I/O for IC/DAQ lab next week
Set up measurement/analysis procedures for next week
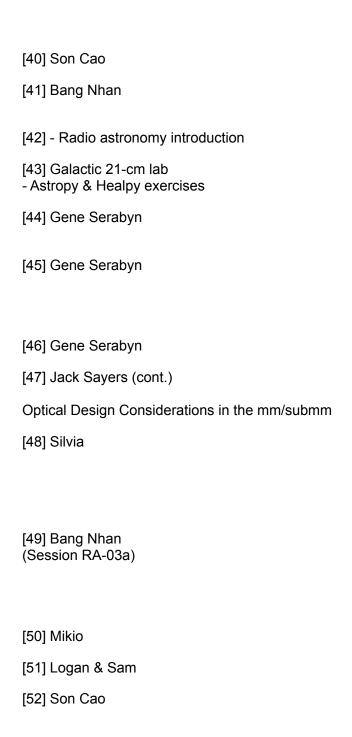
[34] Hien Nguyen

[35] Nguyễn Lương Quang

[36] Logan & Sam

[37] Son Cao

[38] Bang Nhan
(session RA-LAB-01b)

[39] Parallel lab (3 groups each)
- IC/DAQ - groups with odd number
- RA - groups with even number

[40] Son Cao

[41] Bang Nhan

[42] - Radio astronomy introduction

[43] Galactic 21-cm lab
- Astropy & Healpy exercises

[44] Gene Serabyn

[45] Gene Serabyn

[46] Gene Serabyn

[47] Jack Sayers (cont.)

Optical Design Considerations in the mm/submm

[48] Silvia

[49] Bang Nhan
(Session RA-03a)

[50] Mikio

[51] Logan & Sam

[52] Son Cao

[53] Bang Nhan
(session RA-LAB-02a)

[54] Parallel lab (3 groups each)
- IC/DAQ - groups with odd number
- RA - groups with even number

[55] Son Cao

[56] Bang Nhan

[57] - Low-noise amplifier
- RF circuit components
- Component datasheet

[58] RF & VNA lab
- Measuring antenna & RF components

[59] Silvia

[60] Silvia

[61] Vo Bich Hien
(Session RA-01a)

[62] Bang Nhan
(Session RA-02a)

[63] Tran Quang Vinh
Statistical Analysis in the context of Planet Transit. Box Least-square (BLS) Periodogram, Planet Detection.

https://drive.google.com/file/d/1wkVVAHTsQ1eCaxpHev4vluSjZRLEIvPB/view?usp=share_link

https://drive.google.com/drive/folders/1RM2g7uQ7XPSPwPnHv6G2slkUvMYepzbp?usp=share_link

https://gist.github.com/hippke/9a1398995898c69038e32a937790bbb3#file-astropy-bls-tutorial-ipynb

[64] Sam & Logan

[65] Logan & Sam

[66] Son Cao

[67] Bang Nhan
(session RA-LAB-02b)

[68] Parallel lab (3 groups each)
- IC/DAQ - groups with odd number
- RA - groups with even number

[69] Son Cao

[70] Bang Nhan

[71] - Radio sciences & applications
- Student projects
(Solar physics, ionospheric studies, space weather, telecommunication)

[72] - Antenna & transmission line
- Low-noise amplifier (LNA)

[73] SDR & GNU Radio labs

[74] Logan and Sam
Set up python/anaconda
Basic data types in python
problem sets available for those who finish early

[75] Logan and Sam. Problem sets on basic python of multiple difficulties available

[76] Bang Nhan / Nguyen Thi Phuong
(Session RA-01b)

[77] Tran Quang Vinh
Demonstration of Statistical Analysis.
https://drive.google.com/file/d/1KU3cCXnZq7xmH8jvvyOos_mx0CQG_BaF/view?usp=sharing

[78] Le Ngan

[79] Bang Nhan
(Session RA-03b)
- Radio observation simulation
- RF Nano VNA measurement
- SDR & GNU Radio intro

[80] Sam & Logan

[81] Logan & Sam

[82] Son Cao

[83] Bang Nhan
(session RA-LAB-03)

[84] Parallel lab (3 groups each)
- IC/DAQ - groups with odd number
- RA - groups with even number

[85] Son Cao

[86] Bang Nhan

[87] - Interferometry intro
- CASA Reduction pipeline introduciton for ALMA (followed up by Fri 7/26 for Photometry session)

[88] - Software Defined Radio (SDR) intro
- GNU Radio intro

- Basic FFT/spectrometer with GNU radio
- Digital Signal Processing (DSP)

[89] Extra lab time & presentation discussion