# Physics 343 Lecture # 10:
# lab 5; interferometry; deconvolution

# Schedule

**This week: first set of "observations" for lab # 5**

**Sections A, F, G, H meet in Serin W309 (my office).**

**Sections B, C, D, E meet in Serin E383 (computer lab).**

**Next week: second full period of "observations" for lab # 5 (meeting place TBD, but likely my office and/or Serin E383 computer lab)**

**Lab participation grade will be higher of scores for the two weeks – but plan on attending both sessions!**

**April 21st: lab # 5 due.**

**May 5th: student choice lecture. Suggestions?**

# 21 people + 6 cars to Green Bank

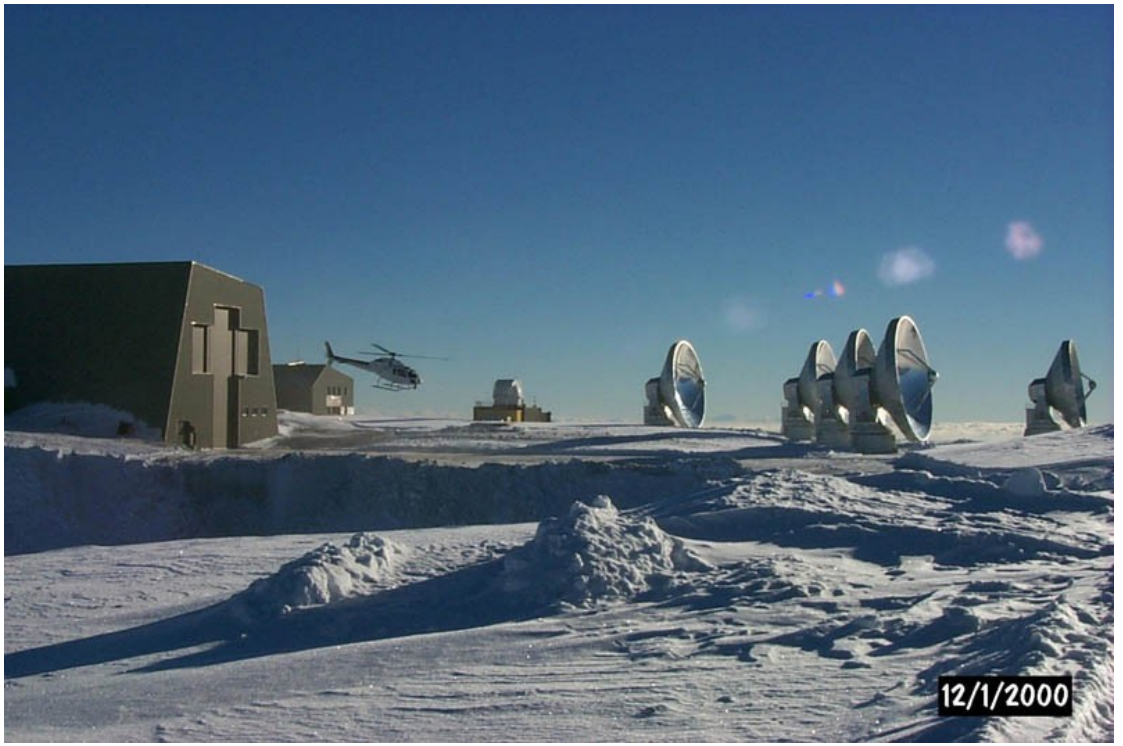
| Departs | Driver | Passengers |
|---|---|---|
| 12:30pm | Baker | Dobaria, Fekete, Wasserman |
| 1:30pm | Perruzzo | Belfer, Brody, Kaufman |
| 2:00pm | Leung | Trinker |
| 2:30pm | Yolleck | Kammerer, King |
| 3:00pm | Singh | Leong, Patel, Rice |
| 4:00pm | Rivera | Fahy, Parikh, Porter |

**This is tentative (may still need to do some reshuffling).**

# Introduction to Lab # 5

**This will be an introduction to interferometric data.**

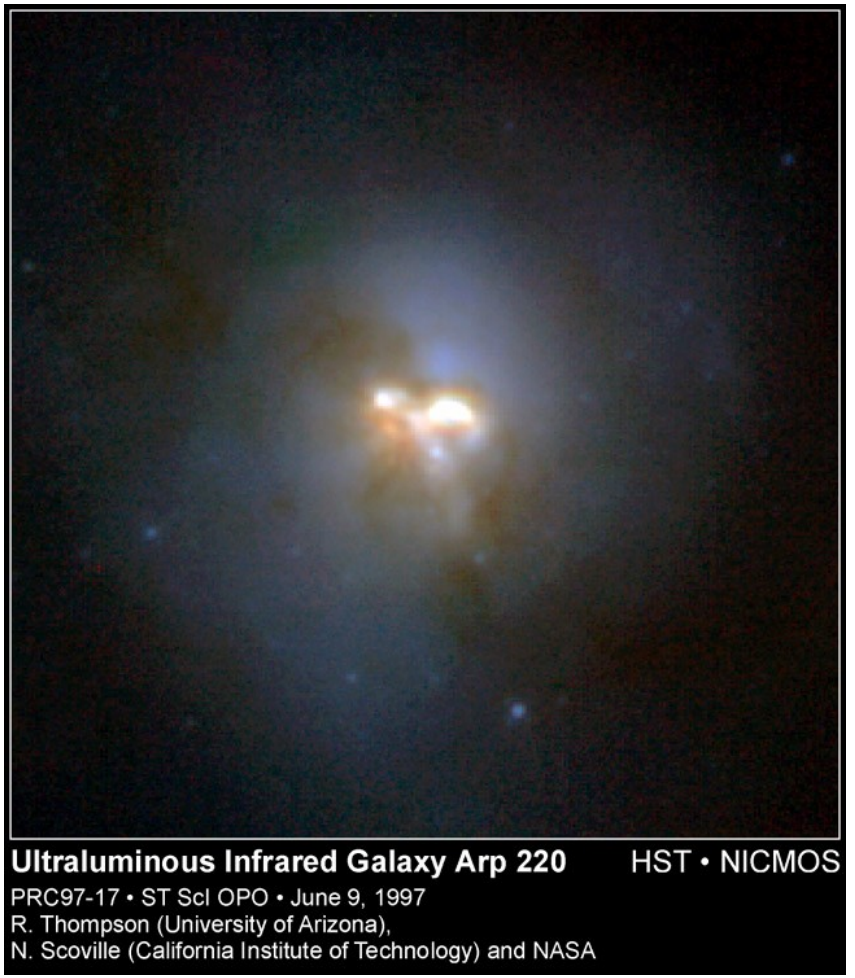
**We do not have an interferometer on the roof! Therefore, you will be working with more archival data, in this case from the IRAM Plateau de Bure Interferometer (located in the Alps outside Grenoble, France).**



# Lab # 5: “observations”

**These observations have been obtained in the CO($J$ = 1 → 0) rotational transition, whose rest frequency is 115.271204 GHz.**

**The target is an ultraluminous infrared galaxy (ULIRG), in which the merger of two progenitor galaxies (e.g., at right) has triggered an intense starburst within the large gas mass that has coalesced at the system's center of mass.**



# Lab # 5: data analysis

**The data have already been calibrated (i.e., corrected for changes in the instrument response with time and frequency).**

**You will be taking the calibrated data (i.e., in the Fourier plane) at each frequency and making maps from them. This will require that you use the Difmap package for deconvolution.**

**Class handout = Difmap cookbook; useful website = http://www.astro.caltech.edu/~tjp/citvlb/**

# Lab # 5: access to data and software

**To access your data and the Difmap package, you will need to log into an account for your section on yona.physics.rutgers.edu.**

**Account name = ph343{a,b,c,d,e,f,g}**
**Account password = constellation name + XXXX**

**You are also welcome to log on remotely as needed using, e.g., ssh -X ph343a@yona.physics.rutgers.edu (use -Y for a Mac).**

# Lab # 5: hints on Linux

**The computer you will be using runs Linux, which makes heavy use of the command line:**

| | |
|---|---|
| **cd** | **changes current working directory** |
| **cp** | **copies existing file to a new name or location** |
| **gv** | **view a PostScript file** |
| **kpdf** | **view a PDF file** |
| **ls** | **lists contents of current directory** |
| **mkdir** | **creates a new directory** |
| **mv** | **moves a file to a new name or location** |
| **ps2pdf** | **convert a PostScript file to a PDF file** |
| **rm** | **removes a file** |
| **rmdir** | **removes a directory** |

# Lab # 5: preparation for lab

**Before you come to lab this week:**

**(1) Read through the instructions for lab # 5 and be prepared to ask questions about anything that's not clear.**

**(2) Read sections 1-7 of the "Difmap cookbook" (skipping section 4.2, which is not relevant). You should focus on the main commands you will need to use for this lab:**

**observe select device uvplot radplot vplot**
**mapunit mapsize uvweight mapplot clean**

# Lab # 5: hints on Difmap devices

**The trickiest part of using Difmap is (re)setting the output device.**

**(1) to screen:**

**"device 1/xs" or "device 2/xs"**

**(2) to hardcopy (an example that produces an output PS file):**

| | |
|---|---|
| **"device output.ps/vcps"** | **[for vertical, color]** |
| **"mapplot cln"** | **[creates the plot you want]** |
| **"device 1/xs"** | **[resets the device to screen!]** |