

Physics 343 Lecture # 10:
lab 5 + deconvolution

Schedule

This week: “observations” for lab # 5

Sections A, B, E, F meet in Serin W309 (my office).

Sections C, D meet in Serin E383 (computer room).

Next week: “analysis” for lab # 5 (likely to be another full period; meet in my office).

April 16th: lab # 5 due.

April 30th: student choice lecture. Suggestions?

13 people + 3 cars to Green Bank

Departs Driver Passengers

1:00pm **Baker** **Krawiec, Osheroff, Singh**

2:00pm **St. John** **Goldsmith, Laudati†, Mettler**

3:15pm **Naudus** **Bish, Frances, Malcolm, Srinivasan**

Return trip: passengers can be reshuffled as needed.

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

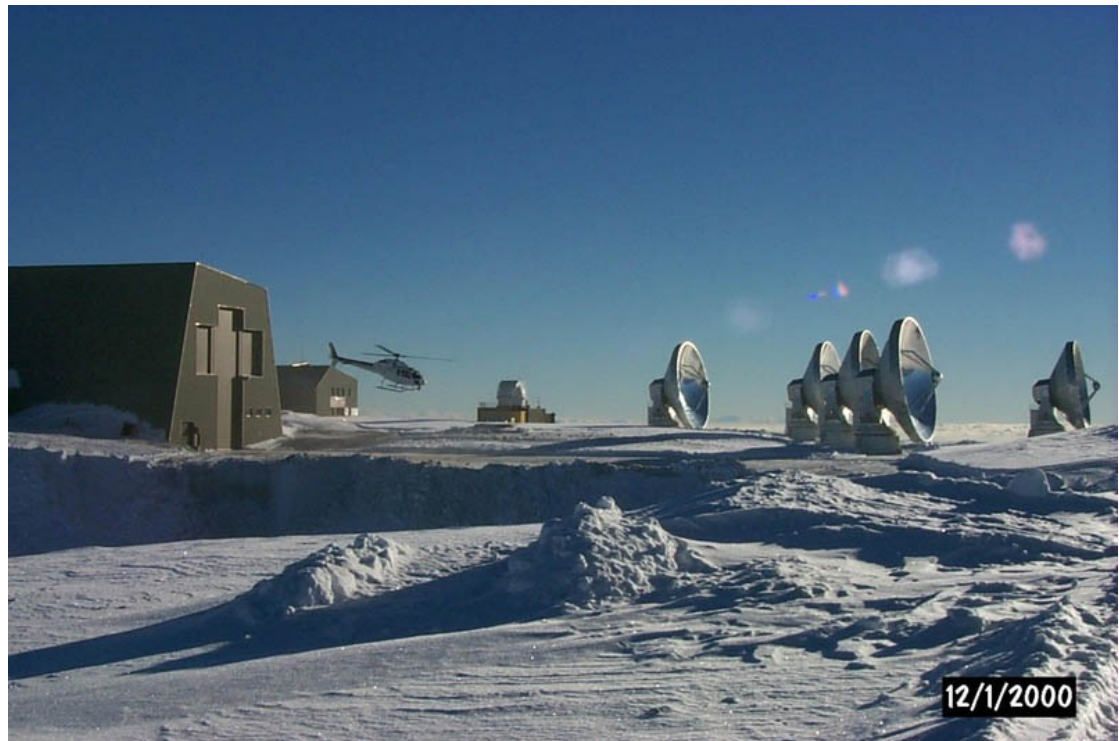
Plateau de Bure

Interferometer

(located in the

Alps outside

Grenoble, France).

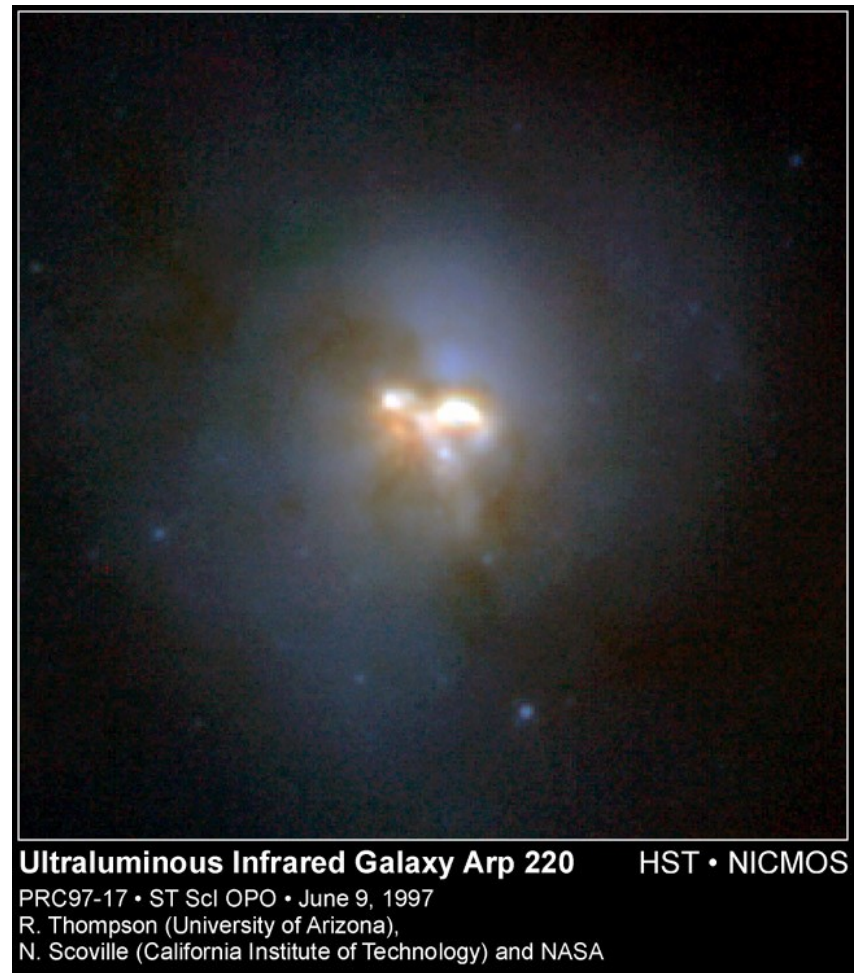


Quiz

Lab # 5: “observations”

These observations have been obtained in the CO($J = 1 \rightarrow 0$) 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 uv 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.rutgers.edu.

Account name = ph343{a,b,c,d,e,f}

Account password = constellation name + XXXX

For the initial lab, come to my office (Serin W309) or the computer lab (Serin E383) during your lab section.

For the rest of the week, log on remotely as needed using, e.g.,
`ssh -X ph343a@yona.rutgers.edu` (use -Y if using 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
- ls** lists contents of current directory
- mkdir** creates a new directory
- mv** moves a file to a new name or location
- 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 **v**ertical, **c**olor]

“mapplot cln”

[creates the plot you want]

“device 1/xs”

[resets the device to screen!]