

**Physics 343 Lecture # 10:
lab 5 + deconvolution**

Schedule

This week: first set of “observations” for lab # 5

All sections meet in Serin W309 (my office).

Next week: guest lecture on galaxy clusters by Amruta

+ second full period of “observations” for lab # 5

**(meeting place TBD, but likely my office of Serin E383
computer lab).**

April 22nd: lab # 5 due.

May 6th: student choice lecture. Suggestions?

19 people + 5 cars to Green Bank

<u>Departs</u>	<u>Driver</u>	<u>Passengers</u>
1:00pm	Baker	Handy, Patel, Rowe
1:30pm	Smith	Apgar, Rzetelny, Sarnicki
2:00pm	Nissenbaum	Herskovitz, Morey, Pikul
2:30pm	Pandya	Chan, Harper, Mustafa
3:00pm	Deshpande	Carroll, Jedrusiak

This is tentative (may still need to do some reshuffling).
For return trip, passengers can be reshuffled as they wish.

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).**

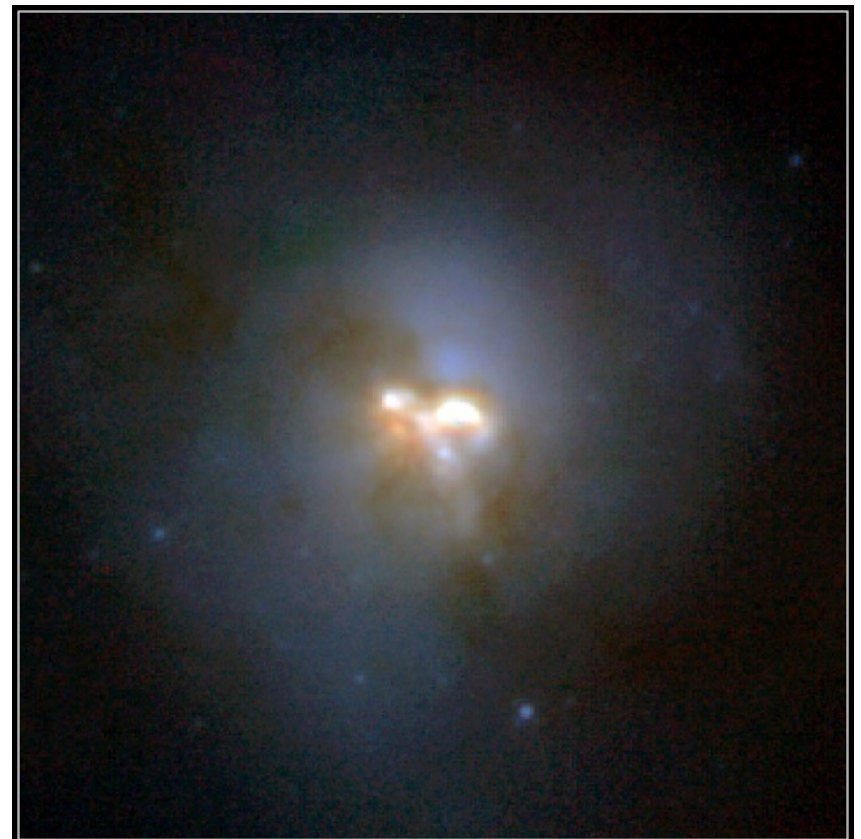


Quiz

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.



Ultraluminous Infrared Galaxy Arp 220 HST • NICMOS
PRC97-17 • ST ScI OPO • June 9, 1997
R. Thompson (University of Arizona),
N. Scoville (California Institute of Technology) and NASA

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

There will be (graded) “observations” meetings of your lab section this week (my office, Serin W309) and next.

You are also welcome to 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
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 **v**ertical, **c**olor]

“maplot cln”

[creates the plot you want]

“device 1/xs”

[resets the device to screen!]