(Astro)Physics 343 Lecture # 10:
lab 4 + lab 5 + deconvolution

18 people + 5 cars to Green Bank

Tentative plan for departure from Rutgers, with drivers in red:

1:00pm   **Baker + Crews, Golugula, Tomczak**

2:00pm   **Kanarek (?) + Merced (?), Uzicanin**

3:00pm   **Urbanowicz (?)+ Karanam, Matthews, Patel**

4:00pm   **Baghal (?) + Shappee, Van Saders**

6:00pm   **Stelling + Jain, Ng, Suszko**

We can shuffle passengers around for the return on Sunday.

A reminder about schedules

April 7-8: analysis week # 4 + lab week # 5

April 14-15: analysis week # 5a; lab # 4 due Mon 4/14

April 21-22: analysis week # 5b; lab # 5 due Thu 4/24

April 25-27: Green Bank trip

Special notes:

    (1) April 12-16: Ross will give 4/14 lecture; I will be in only sporadic email contact, so please send any questions about lab # 4 by noon Saturday.

    (2) May 5: student choice lecture. Please assign me a topic no later than the Green Bank trip!

An update on Lab # 4 data

The new data you took during labs last week may have
been compromised by receiver problems. If so,
explain in your writeup how you know this to be the case.

There are now revised versions of the $l = 25°$ and $l = 130°$
archival datasets at

http://www.physics.rutgers.edu/~ajbaker/ph343/lab4data/

that correctly merge the two halves of the spectra (thanks Bryan).

Introduction to Lab # 5

This will be an introduction to interferometric data.

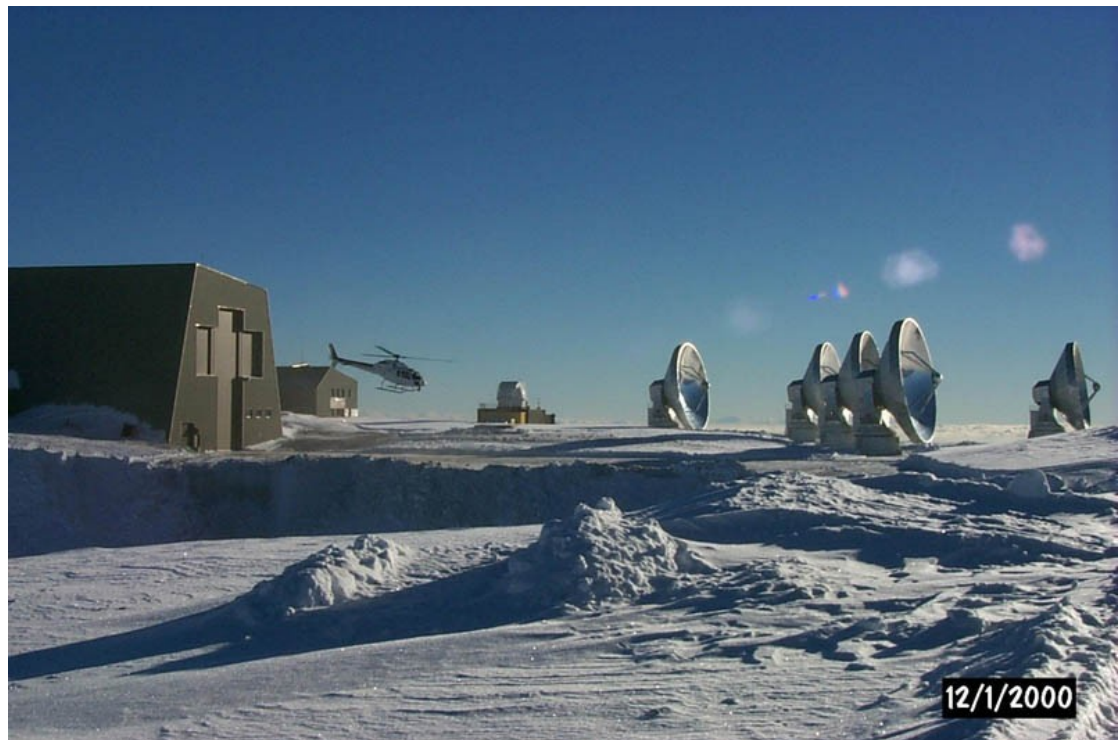**We do not have an interferometer on the roof! Therefore, you will be working with more archival data, in this case from the IRAM Plateau de Bure Interferometer (located in the Alps outside Grenoble, France).**

12/1/2000

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 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 websites =
http://www.astro.caltech.edu/~tjp/citvlb/index.html
http://www.atnf.csiro.au/people/jlovell/difmap/www_help/

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}

Account password = constellation name + 21cm

For the initial lab, come to my office (Serin W309) during your lab section (Sections A and E: meet in 403 first).

For the rest of the week, log on remotely as needed using, e.g., ssh -X ph343a@yona.rutgers.edu.

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 vertical, color]

"mapplot cln"   [creates the plot you want]

"device 1/xs"   [resets the device to screen!]