

Focus on Basic Themes

The first four exercises focus on measurements of distances in the Universe.

The students apply different methods to determine the distance of astronomical objects such as the supernova SN 1987A, the spiral galaxy Messier 100, the Cat's Eye Planetary Nebula and the globular cluster Messier 12. With these results it is possible to make quite accurate estimates of the age of the Universe and its expansion velocity, without the use of computers or sophisticated software.

Students can also perform 'naked-eye photometry' by measuring the brightness of stars on two VLT images (taken through blue and green optical filters, respectively). They can then con-

struct the basic luminosity-temperature relation (the "Hertzsprung-Russell Diagram") providing a superb way to gain insight into fundamental stellar physics.

Six Booklets

The following booklets have been published:

"General Introduction" (an overview of the exercise series),

"Toolkits" (explanation of basic astronomical and mathematical techniques),

"Exercise 1: Measuring the Distance to Supernova 1987A",

"Exercise 2: The Distance to Messier 100 as Determined by Cepheid Variable Stars",

"Exercise 3: Measuring the Distance to the Cat's Eye Nebula" and

"Exercise 4: Measuring a Globular Star Cluster's Distance and Age".

Each of the four exercises begins with a background text, followed by a series of questions, measurements and calculations. The exercises can be used either as texts in a traditional classroom format or for independent study as part of a project undertaken in smaller groups.

The booklets are sent free-of-charge to high-school teachers on request and may be downloaded as PDF files from the website. More exercises will follow in the future, e.g. measuring the velocity and distance to a transneptunian object.

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(1 January 2002 – 31 March 2002)

ARRIVALS

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(1 December 2001 – 28 February 2002)

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LIST OF SCIENTIFIC PREPRINTS

January–February 2002

1454. M.J. Neeser, P.D. Sackett, G. De Marchi, F. Paresce: Detection of a Thick Disk in the edge-on Low Surface Brightness Galaxy ESO 342–G017. I. VLT Photometry in V and R Bands. *A&A*.
1455. D. Elbaz, C.J. Cesarsky, P. Chanial, H. Aussel, A. Franceschini, D. Fadda and R.R. Chary: The bulk of the cosmic infrared background resolved by ISOCAM. *A&A*.
1456. T.-S. Kim, S. Cristiani and S. D'Odorico: The evolution of the physical state of the IGM. *A&A*.

1457. D. Fadda, H. Flores, G. Hasinger, A. Franceschini, B. Altieri, C.J. Cesarsky, D. Elbaz and Ph. Ferrando: The AGN contribution to mid-infrared surveys. X-ray counterparts of the mid-IR sources in the Lockman Hole and HDF. *A&A*.
1458. Y. Momany, E.V. Held, I. Saviane and L. Rizzi: The Sagittarius dwarf irregular galaxy: metallicity and stellar populations. *A&A*.
1459. A. Franceschini, D. Fadda, C.J. Cesarsky, D. Elbaz, H. Flores, G.L. Granato: ESO investigates the nature of extremely-red hard X-ray sources responsible for the X-ray background. *ApJ*.