88.06

New Exercises for the Introductory Astronomy Laboratory from Project CLEA

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Since the summer of 1992, Project CLEA (Contemporary Laboratory Experiences in Astronomy) has been developing modular lab exercises for introductory astronomy that emphasize modern observing techniques using computers. Four modules are now available for the Windows environment each of which incoroporates high-quality bitmapped graphics, a highly interactive simulation of observations, on-line data logging, and extensive printed and on-line documentation. The exercises are The Revolution of the Moons of Jupiter, Radar Measurements of the Rotation Rate of Mercury, Photoelectric Photometry of the Pleiades, and the Hubble Redshift-Distance Relation using digital spectrophotometry. Several additional labs are under development, and less elaborate software is available for Mac machines. We will demonstrate the software, describe the current project, illustrate some of our plans for future development, and provide information on obtaining CLEA material. This research has been supported in part by Gettysburg College and NSF Grants USE 9151535, USE 9155927, and DUE 9350899.

88.07

Modern Laboratory Exercises in Astronomy V: New Lab Exercises, Electronic Publication and Dissemination

D.B. Caton, R.O. Gray, J.T. Pollock, W.C. Burns (Appalachian St.U.), R.L. Hawkins (Wellesley College)

New lab exercises are presented, continuing a series developed over the past few years (see Caton and Pollock, BAAS 18 No. 4, 22 Nos. 1 and 4, and 23 No.4, and 24 No. 4), including a PC-based spectral classification exercise that displays spectra on a VGA screen, and a simple PC-based eclipsing binary light curve simulation program.

Information packets will be available, including software, lab exercises, and instructor's notes. These will be on paper and on (PC) disk, in ASCII and WordPerfect formats, including some figures in AutoDesk's Generic CADD form. This will allow other institutions to modify the exercises to fit their own equipment and procedures.

Information will also be provided on accessing a PC that we have installed on the Internet to allow acquisition of future updates and additional materials that will be developed.

88.08

A CCD on the 30-inch Keeler Telescope at Allegheny Observatory

E.R. Lauzier, F.H. Briggs, B.R. Espey, W.T. Persinger, D.A. Turnshek (University of Pittsburgh)

In 1989 the 30-inch Keeler Telescope at Allegheny Observatory (AO) was upgraded with new optics. We are now integrating a CCD camera on the telescope with the aim of developing a system that can be used for undergraduate and graduate student education as well as certain types of research programs. However, the location of AO near downtown Pittsburgh presents a challenge in terms of dealing with city lights and local interference. The camera uses an 800x800 TI CCD chip with associated electronics as described by Gunn et al. (1987, PASP, 99, 518). FHH Harris Engineering integrated the various components into the CCD camera system. In this contribution the progress made to date on the system will be discussed along with modifications that have been made. Preliminary results on the CCD noise characteristics and flat fields, photometric calibration, and seeing with the Keeler Telescope will also be presented.

88.09

Misconceptions About Astronomy: Their Origins and Effects on Teaching

N. F. Comins (U. of Maine)

Starting in early childhood, everyone acquires ideas about astronomy that are incorrect. By the time students enter introductory astronomy courses in college, they often harbor hundreds of such misconceptions. Over the past three years I have been meeting with small groups of students who are taking introductory astronomy at the University of Maine. In these focus groups we discuss the nature and origin of the misconceptions they have. These students and their peers in the formal introductory astronomy course have supplied me with over 550 common misconceptions about astronomy.

In this paper I present the most common misconceptions and a classification scheme relating them to their origins. I classify the misconceptions as to whether they are primarily due to incorrect internal (mental) processes, to incorrect external input such as inaccurate information from teachers and parents, or from both internal and external source equally. I then present a list of specific sources, such as Aristotelian reasoning or inaccurate observations, that account for all the misconceptions I have received to date. I discussion how the misconceptions they have upon starting a course in astronomy affect students as they learn correct astronomical concepts and how being aware of these misconceptions can help teachers more effectively present the course material.

88.10

Renaming the Big Bang: A Case Study of Popular Ideas on Cosmology

R. T. Fienberg, J. K. Beatty, D. T. Dinsmoor (ST), T. Ferris (UC Berkeley), H. Downs (ABC-TV), C. Sagan (Cornell)

In the August 1993 Sky Telescope one of us (T. F.) argued that the term "Big Bang" is misleading, trivializing, and inappropriately bellicose to describe the event that gave rise to the physical universe as depicted by the standard cosmological model. We issued a challenge to all interested persons to try to come up with a better name. Although we offered no prize, the challenge aroused widespread interest: over a period of three months some 13,000 entries were submitted from 41 countries. Some came from professional astronomers, but most came from nonscientists – from kindergartners and octogenarians, prison inmates and physicians, and many others. This outpouring of creative, pedestrian, religious, ingenious, confused, profound, and insightful suggestions offers an unprecedented look at laypeoples' thinking about the origin of the universe. Some of the suggested new names for the theory are highly original and appropriate.

Session 89: HEAD I–ASCA
Oral Session, 10:15–11:45 am
Salon III

Session 90: Absorption in AGN Spectra
Oral Session, 10:15–11:45 am
Salon IV

90.01

X-Ray Constraints On The Intergalactic Medium

M. Elvis, F. Fiore, T. Aldcroft, J. McDowell (SAO)
J. Bechtold (Steward Observatory, Univ. of Arizona)

ROSAT PSPC observations designed to study the evolution of quasar continuum emission have instead provided a new means of studying the intergalactic medium (IGM):
(1) The first results showed unexpected strong low energy cut-offs in PSPC spectra of z=3 quasars (Wilkes et al. 1992, Elvis et al. 1994 in press). A good case can be made that these are due to 'Damped Lyman-α' absorption systems along the line of sight.
(2) Not all z=3 quasars show cut-offs, including some with known damped Lyman-alpha absorbers, which limits conditions in these systems- ionization state, density and size.
(3) The absence of absorption toward some high z quasars can also be used to put limits on a hot diffuse IGM (an X-ray Gunn-Peterson