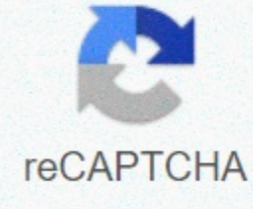




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An Instructor Resource Center page is available with complete notes and text art.Six new Lecture-Tutorials address users’ and reviewer’s most requested areas for addition: Greenhouse Effect Dark Matter Making Sense of the Universe and Expansion Hubble’s Law Expansion, Lookback Times, and Distances The Big BangThe Night Sky Position Motion Seasonal Stars Solar vs. Sidereal Day Ecliptic Star Charts Fundamentals of Astronomy Kepler’s Second Law Kepler’s Third Law Newton’s Laws and Gravity Apparent and Absolute Magnitudes of Stars The Parsec Parallax and Distance Spectroscopic Parallax Nature of Light in Astronomy Electromagnetic (EM) Spectrum of Light Telescopes and Earth’s Atmosphere Luminosity, Temperature, and Size Blackbody Radiation Types of Spectra Light and Atoms Analyzing Spectra Doppler Shift Our Solar System The Cause of Moon Phases Predicting Moon Phases Path of the Sun Seasons Observing Retrograde Motion Earth’s Changing Surface Greenhouse Effect Temperature and Formation of Our Solar System Sun Size Stars, Galaxies, and Beyond H-R Diagram Star Formation and Lifetimes Edward Prather is the Executive Director of the Center for Astronomy Education (CAE) and Associate Professor of Astronomy in Steward Observatory at the University of Arizona. Over the past fifteen years, Ed has been dedicated to improving Earth, Astronomy, and Space Science education through research, curriculum and assessment materials development, and instructor professional development on teaching and learning. He is also the recipient of the 2007 University of Arizona’s Provost Education Prize, the 2009 University of Arizona’s College of Sciences Innovations in Teaching award, and the 2011 American Association of Physics Teacher’s Halliday and Resnick Award for Excellence in Undergraduate Physics Teaching. Tim Slater is the University of Wyoming Excellence in Higher Education Endowed Chair of Science Education. He holds appointments as Professor in both the Department of Physics & Astronomy and the College of Education. An award-winning professor with more than 100 publications, he has spent the last six years as the Education Officer of the American Astronomical Society and served on the Board of Directors for the National Science Teachers Association, the Astronomical Society of the Pacific, and the Society of College Science Teachers. Jeff Adams earned his Ph.D. in theoretical physics from Queen’s University, in Kingston Ontario, Canada. After also becoming a certified high school mathematics and physics teacher, he joined the faculty at Montana State University, Bozeman, where he taught physics and astronomy, mentored graduate students, conducted research on student learning, and developed curricular materials for use in introductory physics and astronomy. In spring 2002, he received the College of Letters and Science award for outstanding teaching. Jeff is currently the Associate Provost for Academic Administration at Millersville University. Gina Brissenden is the Associate Director of the Center for Astronomy Education (CAE) and a Science Education Research Specialist in Steward Observatory at the University of Arizona. She is also the former Education Specialist for the American Astronomical Society. Gina’s work focuses on improving Earth, Astronomy, and Space Science education through research, curriculum and assessment materials development, and instructor professional development on teaching and learning.Courses back Time & Place: Mondays and Wednesdays, 4:00-6:30, room 23, TOCC new campus Instructors: Dr. Colette Salyk and Dr. Katy Garmany Email: csalyk at noao.edu, garmany at noao.edu Class text: Lecture Tutorials for Introductory Astronomy, 3rd edition Additional reference textbooks are located in the library, in the reserve section Other class materials: Ipads are required. 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