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- 3.34 Galileo: Myths Versus Facts — Jim Lattis (*U. of Wisconsin*)

4. Articles on Teaching and Learning Astronomy

- 4.1 Learning Astronomy: Insights from Research and Practice — Cary Sneider (*Portland State U.*)
- 4.2 Teaching Astronomy in the 21st Century — Cary Sneider (*Portland State U.*)
- 4.3 The Project ASTRO Philosophy (for Astronomy Education) — Dennis Schatz (*Pacific Science Center*)
- 4.4 Education Reform and Science Standards — Dennis Schatz (*Pacific Science Center*)
- 4.5 Astronomy in the K–8 Core Curriculum: A Survey of State Requirements Nationwide — Stacy Palen and AmyJo Proctor (*Weber State U.*)
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- Partners in Learning: The Project ASTRO Video
- What is Your Favorite Activity or Demonstration
- Kinesthetic Astronomy
- Pocket Solar System
- Are They Really Learning What We Want Them to Learn
- Worlds in Comparison
- Cook Up a Comet
- Big Dipper Clock
- Is it Alive
- Making Visors
- Seeing Through Alien Eyes
- The Night Sky Network: An Introduction

6.2 Images

- Background Article 2.2: Grand Tour of the Universe (55 selected images showing planets, stars, nebulae, galaxies)
- Activity C10: Revolutionary Venus (phases of Venus over 15 months)
- Activity C13: In the Footsteps of Galileo (positions of Jupiter's Galilean moons over nine nights)
- Activity F7: 3-D Constellations (Photos of the Big Dipper and Orion)
- Activity G6: Jewels of the Night (Image of Star Cluster NGC 4755)
- Activity H5: Galaxy Sorting images (20 images of galaxies)
- Activity H6: How Many Galaxies Are There (3 images from the Hubble Deep Field)
- Activity J8: Red Hot, Blue Hot (4 postcards of the US, and 2 views of Rusty the dog)

6.3 Audio

- Activity I7: Decoding Radio Messages from Space (5 audio tracks with "messages")
 - Sound Sample
 - Slow Hi
 - Slow Smiley
 - Fast Hi
 - Fast Smiley

ACTIVITIES

A. The Moon and Its Phases

- A1. Images of the Moon: Predicting Phases and Features — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- A2. Observing the Moon's Phases and Features — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- A3. Modeling Moon Phases — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- A4. Modeling Eclipses — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- A5. Moon Rise, Moon Set — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- A6. Dark Side of the Moon — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- A7. Exploring Lunar Phases with a Daytime Moon — Marni Berendsen, et al. (*ASP*)
- A8. Impact Cratering — Ronald Greeley (*Arizona State U.*)

B. The Sun in the Sky and the Seasons

- B1. Moving Shadows — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- B2. Pocket Sun Clock — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- B3. The Sun through the Seasons — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- B4. High Noon? — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- B5. Observing Where the Sun Sets — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- B6. Solar Motion Demonstrator — *Lawrence Hall of Science Astronomy Education Program*
- B7. The Reasons for Seasons — *Lawrence Hall of Science Astronomy Education Program*
- B8. Modeling the Reasons for Seasons — Project STAR (*Harvard-Smithsonian Center for Astrophysics*)
- B9. Exploring the Reasons for Seasons: A Symposium — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- B10. Sky Time from Kinesthetic Astronomy — Cherilynn Morrow (*Georgia State U.*) and Mike Zawaski (*Front Range Comm. Coll.*) [note that this suite of activities comes in 4 parts]

C. The Planets

- C1. The Earth's Shape and Gravity — Cary Sneider, et al. (*Lawrence Hall of Science, GEMS*)
- C2. What Shape is the Earth? — *Lawrence Hall of Science Astronomy Education Program*
- C3. How Big is the Earth? — *Lawrence Hall of Science Astronomy Education Program*
- C4. Sorting the Solar System — Alice Gift Enevoldsen (*Pacific Science Ctr.*) & Anna Hurst Schmitt (*ASP*)
- C5. How Old Are You (On Other Planets)? — *Hawaii Space Grant Consortium*
- C6. Postcards from Another World — Andrew Fraknoi (*Foothill Coll.*)
- C7. Remember the Egg (and Planetary Details) — Allan Meyer (*NASA Ames*)
- C8. Morning Star and Evening Star (Venus in the Sky) — *Lawrence Hall of Science Astronomy Education Program*
- C9. Venus Topography Box — Larry Lebofsky (*U. of Arizona*), et al.
- C10. Revolutionary Venus: How Observing Venus with a Telescope Changed the World — Vivian White (*ASP*)
- C11. Mars Opposition Dance — Suzanne Gurton & Anna Hurst Schmitt (*ASP*)
- C12. Should Pluto be Considered a Planet: A Student Symposium — Andrew Fraknoi (*Foothill Coll.*)
- C13. In the Footsteps of Galileo: Observing the Moons of Jupiter — John Erickson (*Lawrence Hall of Science*), et al.
- C14. Long Distance Detective (Measuring Craters) — William Hartmann, et al. (*Planetary Science Inst.*)
- C15. Making and Mapping a Volcano — *NASA Johnson Space Flight Center*
- C16. What Craters Can Tell Us about a Planet — *TERC and NASA*

C17. The Incredible Egg Drop Challenge — *NASA Ames Research Center*

C18. Do Fish Believe in Water? Do Students Believe in Air? — *TERC and NASA*

D. The Scale of the Solar System

D1. A Question of Scale — *Lawrence Hall of Science Astronomy Education Program*

D2. Toilet Paper Solar System — *Gerald Mallon and Suzanne Gurton (ASP)*

D3. Scaling New Worlds: Scale Models of Planets around Other Stars — *Andrew Fraknoi (Foothill Coll.)*

D4. The Earth as a Peppercorn (or The Thousand Yard Model) — *Guy Ottewell (Furman U.)*

D5. Solar System in Your Pocket — *Amie Gallagher (Raritan Valley Comm. Coll.), et al.*

D6. Bike Years Versus Light Years: Calculating Stellar Travel Times — *SETI Institute*

D7. Sizing Up the Moon: Earth-Moon Scale Model — *Dennis Schatz (Pacific Science Ctr.) & Anna Hurst Schmitt (ASP)*

D8. Can Mars Ever Look as Big as the Moon? — *Suzanne Gurton (ASP)*

D9. Grapefruit Saturn — *Lynda Filip & John Percy (U. of Toronto)*

D10. Worlds in Comparison — *Dennis Schatz (Pacific Science Ctr.) & Anna Hurst Schmitt (ASP)*

D11. Your Weight on Other Worlds — *Andrew Fraknoi (Foothill Coll.)*

E. Comets, Asteroids and Meteors

E1. Make a Model Comet — *Dennis Schatz (Pacific Science Ctr.)*

E2. Making a Comet in the Classroom — *Dennis Schatz (Pacific Science Ctr.)*

E3. Make a Comet Motion Flip Book — *Dennis Schatz (Pacific Science Ctr.)*

E4. Vegetable Light Curves (and Asteroids) — *B. J. McCormick (McREL)*

E5. Follow the Falling Meteorite — *NASA Johnson Space Flight Center*

E6. Searching for Meteorites — *NASA Johnson Space Flight Center*

E7. Crater Hunters — *NASA Johnson Space Flight Center*

F. Star Finding and Constellations

F1. Big Dipper Star Clock — *Dennis Schatz, et al. (Pacific Science Ctr.)*

F2. What's Your Latitude? — *Lawrence Hall of Science Astronomy Education Program*

F3. Star Finding with a Star Finder — *Dennis Schatz, et al. (Pacific Science Ctr.)*

F4. Star Frames — *Ben Mayer*

F5. The Earth's Revolution and the Zodiac — *Jeanne Bishop (Westlake Public Schools)*

F6. Sky Heroes: An Activity Reinventing the Constellations — *Andrew Fraknoi (Foothill Coll.)*

F7. 3-D Constellations — *Project STAR (Harvard-Smithsonian Center for Astrophysics) & Anna Hurst Schmitt (ASP)*

G. The Sun and the Stars

G1. Projecting an Image of the Sun — *Dennis Schatz, et al. (Pacific Science Ctr.)*

G2. What Causes Sunspots? — *Dale Gary (New Jersey Institute of Technology), et al.*

G3. The Sun's Period of Rotation — *Beverly Meier (Boulder Valley School District), et al.*

G4. Maunder Mystery Story — *NASA Johnson Space Flight Center*

G5. What's It Like Inside the Sun: Convection and Miso Soup — *Kara Granger (NASA Goddard Space Flight Ctr.)*

G6. How Old Are the Jewels of the Night? — *Jeff Lockwood & Connie Walker (National Optical Astronomy Observatories)*

- G7. Estimating Star Brightness — Janet Mattei (AAVSO) and John Percy (*U. of Toronto*)
- G8. How Big is That Star? — Kara Granger & Laura Whitlock (*NASA Goddard Space Flight Center*)
- G9. Birthday Stars — Timothy Ferris
- G10. Measuring a Kid Minute (Understanding a Light Year) — *NSTA*, Suzanne Gurton & Anna Hurst Schmitt (ASP)
- G11. Investigating Types of Stars — *SETI Institute*
- G12. Starry Lives, Starry Skies — Andrew Fraknoi & Marni Berendsen (ASP)
- G13. Finding & Measuring Delta Cephei — John Percy (*U. of Toronto*) & George Musser (ASP)
- G14. Transit Tracks: Planets Around Other Stars — *Kepler Mission Education and Outreach Team*
- G15. Parallax: How Far Is It? — *Lawrence Hall of Science Astronomy Education Program*
- G16. Parallax: Going Further — *NASA Office of Space Science Universe Forum*

H. Galaxies and the Universe

- H1. Your Galactic Address — *Lawrence Hall of Science Astronomy Education Program*
- H2. The Cosmic Calendar (from an idea by Carl Sagan) — Therese Blanchard (ASP), et al.
- H3. How Many Stars — Allen Krone, Project SPICA (*Harvard-Smithsonian Center for Astrophysics*)
- H4. The Birdseed Galaxy — Marni Berendsen (ASP)
- H5. Galaxy Sorting — Sally Stephens (ASP)
- H6. How Many Galaxies Are There: Counting Using the Hubble Deep Field — Gina Cash (*Hammond Middle School*), et al.
- H7. A Ballooning Universe — *Lawrence Hall of Science Astronomy Education Program*
- H8. The Expanding Universe — *Lawrence Hall of Science Astronomy Education Program*
- H9. Modeling the Expanding Universe — *NASA Office of Space Science Universe Forum*
- H10. Cosmic Survey: What Are Your Ideas About the Universe? — *NASA Office of Space Science Universe Forum*

I. Space Exploration and SETI

- I1. Crash Landing — *NASA*, Suzanne Gurton (ASP)
- I2. Building a Lunar Settlement — — *Lawrence Hall of Science Astronomy Education Program*
- I3. Invent an Alien — Dennis Schatz, et al. (*Pacific Science Ctr.*)
- I4. Sending a Message into the Unknown — Jill Tarter (*SETI Institute*), et al.
- I5. Separating a Radio Signal from Noise — Jill Tarter (*SETI Institute*), et al.
- I6. Message to the Universe — Dennis Schatz (*Pacific Science Center*)
- I7. Decoding Radio Messages from Space — Dennis Schatz (*Pacific Science Center*)
- I8. Translating an Alien Message — Dennis Schatz (*Pacific Science Center*)
- I9. Who Speaks for Earth — Andrew Fraknoi (*Foothill Coll.*)
- I10. Is It Alive? — Suzanne Gurton (ASP), et al.
- I11. How High Up is Space? — Andrew Fraknoi (*Foothill Coll.*)

J. Tools of the Astronomer

- J1. Light Collecting Model — *Astronomical Society of the Pacific*
- J2. The Inverse Square Law of Light — *NASA Office of Space Science Universe Forum*
- J3. How Your Pupil Changes Size — *The Exploratorium*

- J4. Seeing through Alien Eyes — Dennis Schatz (*Pacific Science Center*), et al.
- J5. Secret Messages — Suzanne Gurton & Anna Hurst Schmitt (*ASP*)
- J6. Spectroscopes and Spectrometers — *Lawrence Hall of Science Astronomy Education Program*
- J7. Digital Images — Tim Slater (*U. of Wyoming*) & Jeff Adams (*Montana State U.*)
- J8. Red Hot, Blue Hot — Marni Berendsen & Anna Hurst Schmitt (*ASP*)
- J9. Seeing the Invisible: Discovering Infrared & Ultraviolet — *Spitzer Science Center*
- J10. Fun with the Sun: Activities with Ultraviolet — *Hands-on Optics Project*
- J11. Sensing the Invisible — Dana Backman, et al (*SOFIA*)
- J12. Be a Quiet Skies Detective — *National Radio Astronomy Observatory*
- J13. Disappearing Orion: Light Pollution and Sky Brightness — Connie Walker, et al. (*National Optical Astronomy Observatories*)

K. Debunking Pseudo-Science

- K1. What's Your Sign? — *Lawrence Hall of Science Astronomy Education Program*
- K2. Activities About Astrology — Andrew Fraknoi (*ASP*)
- K3. UFO Detective — Andrew Fraknoi (*ASP*)
- K4. Did We Actually Land on the Moon? - An Activity and Symposium — Andrew Fraknoi (*Foothill College*)

L. Astronomy in Different Cultures

- L1. Create a Constellation — Dennis Schatz (*Pacific Science Center*), et al.
- L2. Ancient Models of the World — *Lawrence Hall of Science Astronomy Education Program* and *GEMS series*
- L3. The Astronomical Tourist: What and Where in the World to Visit — Andrew Fraknoi (*ASP*)
- L4. Teaching with Stories and Symbols — Thea Canizo (*U. of Arizona*)
- L5. Toad in the Moon — Suzanne Gurton (*ASP*)
- L6. Schoolyard Medicine Wheel — Benjamin Burrell (*Chabot Space & Science Center*), et al.

M. Across the Curriculum: Interdisciplinary Teaching Ideas

- M1. Who Was Right (About the Size of the Earth)? — *Lawrence Hall of Science Astronomy Education Program*
- M2. Bill Gates' Great-Great-Granddaughter's Honeymoon: The Top Tourist Sights of the Solar System — Andrew Fraknoi (*Foothill Coll.*)
- M3. Astronomy in the Marketplace — Dennis Schatz (*Pacific Science Center*), et al.
- M4. Finding the Music of the Spheres: Astronomy in Music — Andrew Fraknoi (*Foothill Coll.*)
- M5. Women in Astronomy — Andrew Fraknoi (*Foothill Coll.*)
- M6. Picturing an Astronomer — Alan Friedman (*NY Hall of Science*) & Andrew Fraknoi (*ASP*)
- M7. Counting to a Billion — Johnnie Parker, Project SPICA (*Harvard-Smithsonian Center for Astrophysics*)
- M8. Finding Your Way to Mars, Pennsylvania: Astronomy & Geography — Andrew Fraknoi (*Foothill Coll.*)
- M9. A Flag for Your Planet — Andrew Fraknoi (*ASP*)
- M10. How Many Days are in a Year? — Evan Manning (*Jet Propulsion Lab*)
- M11. The Night You Hatched — Chuck Bueter, et al.
- M12. The Hypothesis Game — John Chamberlain, et al.