

Cosmic Connections: An Introduction to Astronomy and Maine's Magnificent Night Skies

Instructor: Russell F. Pinizzotto, Ph.D. (Russ)

Tuesday, 9:30 am to 11:30 am

03 February 2026 to 24 March 2026

<https://maine.zoom.us/j/84333945421?pwd=EhJZLLA50n5jOwhppe37V6TOynw2Rc.1>

Hour 1 — Welcome and Orientation to Maine's Magnificent Night Skies

0:00–0:10 – Welcome and Introductions

0:10–0:50 – What we can see from Maine

- Seasonal overview
- SkyMaps – www.skymaps.com
- Constellation basics
 - **SkySafari demo** (Constellations and Stars you should know how to find)
- Planisphere
- Light pollution map – www.lightpollutionmap.info
- 0:50–1:00 – Q&A, recap, break

Moche References:

- *Introduction: Cosmic View*
- *Chapter 1: Understanding The Starry Sky*

Hour 2 — Understanding Motion and the Celestial Sphere

0:00–0:10 – Warm-up

0:10–0:20 – Find cardinal directions (apps, maps)

- Google Earth
- maps.google.com

0:20–0:50 – Earth's rotation & the sky

0:50–1:00 – Q&A, recap

Moche References:

- *Chapter 1: Understanding The Starry Sky*

Optional Homework: observe the night sky!

Hour 3 — Seasons & the Tilted Earth

0:00–0:10 – Warm-up

0:10–0:35 – Tilt, not distance

0:35–0:50 – Flashlight + ball tilt demo

0:50–1:00 – Q&A

Moche References:

- *Chapter 1: Understanding The Starry Sky*
-

Hour 4 — The Moon: Phases & Patterns

0:00–0:10 – Share observations

0:10–0:30 – Why the Moon has phases

0:30–0:50 – Moon phase calendar

0:50–1:00 – Wrap-up

Moche References:

- *Chapter 10: The Moon*
 - Diagrams: waxing/waning, geometry of phases
-

Optional Homework: observe the Moon!

Hour 5 — Eclipses & Tides

0:00–0:10 – Eclipse memories

0:10–0:30 – Solar/lunar eclipse mechanics

0:30–0:50 – Tides explained (water-glass demo)

0:50–1:00 – Recap

Moche References:

- *Chapter 10: The Moon*
-

Hour 6 — Tour of the Inner Solar System

0:00–0:10 – Warm-up

0:10–0:35 – Mercury, Venus, Earth, Mars

0:35–0:55 – NASA “Eyes” virtual tour

0:55–1:00 – Q&A

Moche References:

- *Chapter 8: Exploring The Solar System*
 - *Chapter 9: The Planets*
 - Sections on Mercury, Venus, Earth, and Mars
-

Optional Homework: observe the tides!

Hour 7 — The Outer Solar System

0:00–0:10 – Warm-up video

0:10–0:35 – Giant planets overview

0:35–0:50 – Scale distances activity

0:50–1:00 – Wrap-up

Moche References:

- *Chapter 9: The Planets*
 - Sections on Jupiter, Saturn, Uranus, Neptune
-

Hour 8 — Comets, Asteroids, and Dwarf Planets

0:00–0:10 – Space rocks show & tell

0:10–0:30 – Kuiper Belt, Oort Cloud, Pluto

0:30–0:50 – Comet vs asteroid surfaces (image analysis)

0:50–1:00 – Q&A

Moche References:

- *Chapter 9: The Planets*
 - Section on Dwarf Planets
 - *Chapter 11: Comets, Meteors, and Meteorites*
 - Comet structure diagrams (coma, tail, nucleus)
-

Optional Homework: Identify Jupiter and Saturn with the unaided eye and/or binoculars.

Hour 9 — The Sun: Our Star

0:00–0:10 – Warm-up

0:10–0:35 – Structure & solar weather

0:35–0:50 – Live SOHO/SDO images

0:50–1:00 – Wrap-up

Moche References:

- *Chapter 4: The Sun*
 - Solar cycle figures
-

Hour 10 — Stars: Birth to Death

0:00–0:10 – Myth vs reality

0:10–0:30 – Protostar → main sequence → giant

0:30–0:50 – Photo classification by temperature

0:50–1:00 – Recap

Moche References:

- *Chapter 3: The Stars*
 - *Chapter 5: Stellar Evolution*
-

Hour 11 — Explosive Ends: Supernovas & Neutron Stars

0:00–0:10 – Famous supernovas

0:10–0:30 – Mechanism

0:30–0:50 – Compare remnants: Crab, Cas A

0:50–1:00 – Q&A

Moche References:

- *Chapter 5:Stellar Evolution*
 - Supernova diagrams, neutron star descriptions
-

Hour 12 — Black Holes & Exotic Objects

0:00–0:10 – Questions & myths

0:10–0:30 – What black holes really are

0:30–0:50 – Simulate spacetime curvature

0:50–1:00 – Wrap-up

Moche References:

- *Chapter 5:Stellar Evolution*
 - Accessible explanations of gravity, spacetime diagrams
-

Hour 13 — The Milky Way

0:00–0:10 – Warm-up

0:10–0:30 – Structure, nebulae, clusters

0:30–0:50 – Milky Way map navigation

0:50–1:00 – Q&A

Moche References:

- *Chapter 6: Galaxies*
 - Disk/bulge/halo structure, star clusters
-

Hour 14 — Galaxies & the Universe Beyond

0:00–0:10 – Warm-up images

0:10–0:30 – Types of galaxies

0:30–0:50 – Classify Hubble images

0:50–1:00 – Recap

Moche References:

- *Chapter 6: Galaxies*
 - Hubble tuning fork, galaxy evolution
-

Optional Homework: Observe the Milky Way with the unaided eye or binoculars.

Find M31, the Andromeda Galaxy with the unaided eye or binoculars.

Hour 15 — Cosmology: Big Bang, Dark Matter, Dark Energy

0:00–0:10 – Warm-up
0:10–0:30 – Expansion of the universe
0:30–0:50 – Simple demos
0:50–1:00 – Q&A

Moche References:

- *Chapter 7: The Universe*
 - Expansion diagrams, balloon analogy, dark matter evidence
-

Hour 16 — Practical Observing and Course Wrap-Up

0:00–0:10 – Warm-up
0:10–0:30 – Observing from Maine

- Best seasons
- Binocular basics
- **SkySafari demonstration**

0:30–0:50 – Personal observing plan
0:50–1:00 – Course recap & next steps

Moche References:

- *Chapter 1: Understanding the Starry Sky*
 - *Chapter 2: Light and Telescopes*
 - *Appendices: sky charts & observing tips*
-