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Educational Programs & Materials

Creator / Writer / Presenter

The following are educational programs and materials that I created, wrote, and presented myself.

‘CSI’ — College of Staten Island // ‘FL’ — Freelance
‘HP’ — Hayden Planetarium // ‘LSC’ — Liberty Science Center // ‘NEAF’ — NorthEast Astronomy Forum
‘SICM’ — Staten Island Children’s Museum // ‘TNSC’ — Trailside Nature & Science Center

Astronomy

THE ANATOMY OF A COMET: UP CLOSE AND PERSONAL	grade 6-8	NEAF / TNSC / FL
Demonstration of creating a ‘comet’ from common materials and observing its structure.		
ASTRONOMICAL ANIMALS	all ages	TNSC
Learn about animal constellations including the Big Bear, Leo the Lion, Cygnus the Swan, Draco the Dragon, the Crab and more.		
AUTUMN ASTRAL ARRANGEMENTS	all ages	TNSC
What can you see in the fall sky? Learn where to find the planets among the stars and which constellations will be visible. Also find out about upcoming meteor showers.		
BACKYARD ASTRONOMY	all ages	FL
So much to see in the night sky — right from your own backyard! With just a few simple tools of a star chart, red light, and warm clothing, you can find your way around.		
BECOME A LUNATIC	all ages	TNSC
Earth’s closest neighbor is not just a pretty sight; it can also give us important clues about Earth. It affects us by causing tides and slowing down Earth’s rotation. Why does it seem to change shape? And can it really affect your mood? By the end of this show, you’ll be a lunar expert!		
CALENDAR	all ages	TNSC
What does Y2K really mean? Does it actually have special significance? Throughout history people have been keeping track of days and years. Different cultures recorded these observations into calendars. Kick off the year 2000 by taking a look at what all the fuss is about.		
CELEBRATE SUN!	all ages	LSC
Understanding eclipses and making eclipse viewers, looking at the heat energy of the Sun and solar power, and making sun prints and sun dials.		
CELESTIAL NAVIGATION	all ages	TNSC
If you were lost without a GPS would you be able to find your way? Learn the basics of navigating by the stars and how Columbus got to America.		
DEATH BY ASTEROID?	all ages	TNSC
The leading theory of dinosaur extinction is a massive impact from space. Could this happen to us? Not if we can help it! Learn about comets, meteors, and asteroids, and what we can do to prevent a mass extinction of our own.		

Astronomy *continued*

DEEP SKY WONDERS	all ages	TNSC
The naked eye can't see distant, faint objects in the night sky. Explore these objects through images taken by giant telescopes and learn about galaxies, nebulae and other deep sky wonders.		
DINO'S & SPACE DUST	all ages	TNSC
Learn about the dinosaur space dust extinction theory. Play 'Name that Dinosaur!'		
EARTH: THE ONE & ONLY	age 4-6	TNSC
Why is Earth so special? How did it form? How does the Moon affect life on Earth? Learn how Earth's atmosphere acts like a spacesuit and what global warming and the greenhouse effect are all about.		
EARTH IS ROUND	age 4-6	TNSC
If Earth is round, why does it look flat? How do we know it's round? Can we tell by looking at the stars? How did Columbus use the sky to get to America?		
FAMILY OF THE SUN	all ages	TNSC
Tour the Solar System and look at some of the more interesting moons of other planets. Sing a song to learn the names of all our neighboring planets.		
FUNDAMENTALS OF THE COSMOS	adults	HP Course
A primer on the Universe, which may be used as a foundation for further courses. Topics include: the Earth/Moon/Sun system; Solar System; stars; the Milky Way and other galaxies; and basic celestial mechanics.		
GREEK MYTHOLOGY	public	HP
The stories of Greek mythology as they pertain to the sky.		
GUYS IN THE SKY	family	FL
A look at all the men in the heavens — from Orion and Hercules, to Boötes and Perseus, Cepheus to Sagittarius.		
THE HISTORY & FUTURE OF ASTRONOMY	all ages	TNSC
Astronomy is both the oldest and newest science. From the beginning, humans have looked to the sky to explain the world around them. Take a look at astronomy from "way-back-then" 'til "who-knows-when."		
IS THERE ANYONE OUT THERE?	all ages	TNSC
This is an immense question. Take a look at various pieces of this puzzle and draw your own conclusions about one of the great mysteries of the Universe.		
KID ASTRO	age 6-7	HP Course
This course covers the basics of what makes Earth so special, why there is day and night, and why the Moon seems to change shape. We'll look at rainbows, tell sky stories, make a comet, and walk thru the Solar System. Each class will include hands-on activities and a project to take home.		
OF MAPS AND MYTHS	public	HP
Ancient sky watchers looked at the sky through the eyes of storytellers. Their ideas of life are reflected in the stories and myths that were drawn using the stars. Using maps based on those stories and myths, astronomers explore space and develop new ideas and theories.		
NATIVE AMERICAN SKY LORE	all ages	TNSC
Delve into the beautiful mythology of Native American peoples. Look at the sky as Native Americans did. Hear how grandmother spider stole the Sun, how coyote was the Moon, and many other legends.		
PLANET EARTH	all ages	TNSC
A look at what's so special about Earth. Sing a song to learn the names of all our neighboring planets and how they're different than Earth.		

Astronomy *continued*

- THE REASON FOR THE SEASONS** all ages TNSC
 What is the reason that Earth has seasons? How did ancient peoples view this occurrence of changing weather? Find out in this look at the various motions of planet Earth.
- SACRED SKY** all ages TNSC
 Many cultures around the world celebrate holidays in December. We'll look at how peoples throughout the ages have been using the sky as a seasonal calendar to know when to plant their crops and hunt migrating animals. We'll also see that celestial associations were believed to foretell future events.
- SCIENTIFIC REVOLUTION** adults HP Course
 Sir Isaac Newton once wrote, "If I have seen further, it is by standing upon the shoulders of giants." Scientists throughout history have extended the knowledge of their predecessors by tiny increments and by leaps & bounds. It is the work, and thought, of those who led the paradigm shifts that will be the focus as we explore how the fundamental ideas of physics, from sub-atomic to supergalactic scales, took shape.
- SEIZE THE NIGHT** grade 3-5; 6-8; adult LSC Course
 A look at the mechanics of why we see the sky as we do, how the sky changes with latitude, and the rotation & revolution of Earth.
- SEASONAL SKIES AND PLANET PARADES** public HP
 The sky is ever changing night to night, but ever constant across the years. Come see what's up in the sky near you this season, and where to look for planets.
- THE SKY INSIDE** age 4-6 TNSC
 Explore day and night skies with a preschooler. Learn planetarium basics, the transition of day into night, and the movement of the Sun, Moon, and stars.
- SKY STORIES** age 4-6 TNSC
 People long ago used their imaginations when looking at the starry sky to create stories of the characters they saw there. We'll hear many delightful tales from cultures around the world.
- SOLAR SYSTEM STROLL** kids / all ages FL / NEAF / TNSC
 A scale model of the Solar System (up to a half mile).
- SPACESHIP EARTH** age 4-6 TNSC
 Earth is a ball we live on. Everything we see in the sky is around Earth as it travels through space. Sing a song to learn the names of all our neighboring planets.
- STAR HOPPING** public HP
 Find your way around the sky by learning just a few main constellations and asterisms, and then hop around to other parts of the sky.
- STARLAB PROGRAMMING** kids / all ages FL / NEAF
 Short programs orienting to the night sky, including its basic movements, and location of stars & constellations.
- STELLAR SPRING SKIES** all ages TNSC
 What can you see in the spring sky? Learn where to find the planets among the stars and which constellations will be visible.
- SUMMER CELESTIAL SIGHTS** all ages TNSC
 What can you see in the summer sky? Learn where to find the planets among the stars and which constellations will be visible.
- SUN, STARS, SATELLITES AND OTHER STUFF** grade 3-5 LSC Course
 An investigation into why stars twinkle, how to tell time by the Big Dipper, what causes the phases of the Moon, and pacing out the distances of the planets.

Astronomy *continued*

- WHO? WHAT? WHERE? WHEN? WHY?** age 4-6 TNSC
 Who was Jupiter? What is a meteor? Where is the Big Dipper? When did Earth form? Why does the Moon change shape? Little kids have big questions; bring them along and we'll find some answers!
- WHY IS THE SKY BLUE?** all ages TNSC
 A look at the nature of light. Explore colors of the spectrum. Learn about ultraviolet and infrared radiation — what it means to us and how astronomers use it to learn about the Universe.
- WINTER WONDER WORLD** all ages TNSC
 What can you see in the winter sky? Learn where to find the planets among the stars and which constellations will be visible.

Mathematics

- ESTIMATE THE CIRCUMFERENCE OF EARTH** adult LSC / CSI / HP
 A recreation of the technique used by Eratosthenes over 2000 years ago to estimate the circumference of Earth by using shadows and angles.
- EXPERIMENT-OF-THE-MONTH-CLUB — MATHEMATICS** grade K-12 LSC
 A packet of eight math experiments for multiple grade levels to investigate the Pythagorean Theorem, polyhedra, fractals, Möbius Strips, hex-a-flex-agons, topology of string, circles and circular measurements, shadows and sundials, and a challenge to estimate the circumference of Earth.
- MATH MANIA** grade 3-5 LSC Course
 A hands-on look at some not-so-strict geometry — from Möbius Strips and hex-a-flex-agons to gumdrop polyhedra and cookie dissection.
- OPERATION CALCULATION** grade 3-5 SICM Summer Camp
 A week-long investigation into math; topics include the logic of games, tiles & tessellations, sundials, string art, cookie dissection, paper quilts, and more.
- PAPER QUILTS** all ages SICM Workshop
 The art and science of quilt designs dissected; make a quilt design with colored paper and old maps and books.
- WITHOUT GEOMETRY, LIFE WOULD BE POINTLESS!** adult LSC Course
 A discovery that math can be more than just a dreaded bunch of formulae; topics include geometry, probability, limits, algebra, and more.

Physics

BUBBLE-ODOLOGY 101 & 102	grade preK; K-2	LSC Course
An introduction into the science of soap bubbles including what makes them, why bubbles are always round, and how to make a permanent picture of them with bubble painting.		
CATCH THE WAVE	grade 3-5	LSC Course
An overview of sound waves and their properties, how they are produced, and how we hear them — from tin can telephones to rubber band guitars.		
MAGNETIC ATTRACTIONS	grade 6-8	LSC Course
More than just art for your refrigerator, an investigation into attraction/repulsion and making electromagnets with household odds & ends.		
MOTOR BOAT, MOTOR BOAT...	grade 3-5	SICM Workshop
Using materials such as soap, rubber bands and popsicle sticks, create mechanical and chemical motors for toy boats made from paper and wood.		
THE PHYSICS OF EVERYDAY THINGS	grade 3-5; 6-8	LSC Course
Physics is everywhere and it's fun; just look at yo-yos, paper clips, slinkies, roller coasters, dominoes, and tops.		
SCIENCE TRICKS & TREATS	grade 3-5	LSC Course
Learn some wonders of the physical world and then put on a show for your fam!		
WATER, WATER, EVERYWHERE	grade K-2	LSC Course
A look at the marvelous properties of water in its three forms and how it relates to the planet and us.		

Miscellaneous

ANIMATION	all ages	LSC floor activity
A basics in animation, optical illusions, and persistence of vision; make flip cards, zoetropes, and phenakistoscopes.		
KICK THE CAN ICE CREAM	all ages	SICM Workshop
A hands-on (feet-on) good time making delicious ice cream in coffee cans.		
MAD SCIENTIST	all ages	FL
A wacky and fun time making slime, water balloons, and flip cards.		
MAGIC, GOOP, AND SLIME	all ages	SICM Workshop
A fun and messy look at colloids, suspensions, and other Newtonian fluids including mixing up some slime to take home.		
NOT YOUR ORDINARY PUPPETS	grade K-2	LSC Course
Make puppets out of your hands using body paint, odds & ends, and some creativity. Also shadow puppets!		
SCIENCE CAMP	grade 3-5	FL
A two week investigation into the scientific method; topics include water; bubbles; the physics of water balloons; goop and slime; magnets; probability; animation; tornado tubes and vortex action; t-twirlers, astrotubes, and paper airplanes; and an egg drop challenge.		

Producer / Director

The following are educational programs that I created, produced, &/or directed.

- CELESTIAL HIGHLIGHTS** public HP Monthly Program
 On the last Tuesday of each month, enjoy a live presentation under the brilliant night sky of the Zeiss Mark IX Star Projector. This tour of the heavens offers a view of the constantly changing night sky. Learn about the current positions of the Moon, planets, and stars, as well as visual spectacles such as meteor showers, eclipses, and conjunctions.
- DREAMS OF SPACE TRAVEL: PAST, PRESENT, AND FUTURE** public HP Special Event
 Across two evenings, we will explore how the social, political, economic and military climate influenced the imagination of scientists, engineers and the public regarding space travel. These dreams will be traced along with the actual path that space travel has taken. Particular attention will be given to how our achievements fell short of these visions in some ways but exceeded them in others. Night One will commemorate the 50th anniversary of the original 1951 Symposium on Space Travel held at the Hayden Planetarium, which spawned a series of articles on space travel in *Colliers* Magazine that birthed an indelible vision for the public's imagination and fascination with space. Night Two will commemorate and critique the vision of space put forth in the film *2001: A Space Odyssey*.
- EINSTEIN'S RELATIVITY: PAST, PRESENT, & FUTURE** public HP Special Event
 Nearly a century has passed since Albert Einstein developed the theory of relativity. His seminal work in physics overthrew prior sensibilities about space and time that had been in place since the days of Galileo and Newton. In celebration of Einstein's legacy, the Hayden Planetarium will host a panel of physicists to discuss the Big Bang, black holes, time travel, the future of the expanding Universe, as well as give reflections on Einstein as a person and a legend.
- FAR OUT: THE PHOTOGRAPHIC LEGACY OF INTERPLANETARY SPACE PROBES** public HP Special Event
 The influence of a striking photograph on human emotions is not limited to traditional photo-journalism. Images of the Universe have unmatched power to place Earth, and our lives on it, into a humbling cosmic perspective. We gather a diverse panel to discuss and debate the role of planetary images on the art and politics of the human condition. Throughout the panel, selected images will be featured from the book *BEYOND* by Michael Benson.
- ISAAC ASIMOV MEMORIAL DEBATES** public HP Special Event
 Isaac Asimov, one of the most prolific and influential authors of our time, was a dear friend and supporter of the American Museum of Natural History. In his memory, the Hayden Planetarium is honored to host the annual Isaac Asimov Memorial Debate — generously endowed by relatives, friends, and admirers of Isaac Asimov and his work — bringing the finest minds in the world to the Museum each year to debate pressing questions on the frontier of scientific discovery. Proceeds from ticket sales of the Isaac Asimov Memorial Debates benefit the scientific and educational programs of the Hayden Planetarium.
- THIS JUST IN... THE LATEST NEWS FROM THE UNIVERSE** public HP Monthly Program
 On the third Tuesday of each month, the Hayden Planetarium presents discussions of hot topics in astronomy and astrophysics. Find out what's in the news, what it means, and how it fits (or not) with current thinking.
- VENUS TRANSIT 2004** all ages HP Special Event
 On Tuesday morning, June 8, 2004, the teeny circular disc of our sister planet Venus will pass directly between Earth and Sun. Join us on the Arthur Ross Terrace as the Hayden Planetarium hosts safe viewing of this rare celestial event, which no one alive has seen. We'll provide telescopes especially equipped with solar filters, video projection, and other optical aids. And, of course, we'll also have an ensemble of experts to keep you informed with what's happening.
- VIRTUAL UNIVERSE** public HP Monthly Program
 On the first Tuesday of each month, you'll be immersed in the Hayden Planetarium's three-dimensional atlas of the Universe and tour through charted space — an experience that will redefine your sense of "home." Step into the Hayden Sphere for a mind-expanding trip through our Digital Universe.