COSMIC TRAILS PROGRAM

13th of December — Monday

5pm **Ship Departs from Fort Lauderdale**

6:30pm – 7:30pm **Bon Voyage Cocktail Party**
[Crow's Nest]

14th of December — Tuesday

8am **Ship Arrives Half Moon Cay**

3pm **Ship Departs from Half Moon Cay**

3:30pm – 5pm **Winter-Sky Wonders**
Susan French — [Hudson Room]

For many of us, this is the coldest time of the year — but it also harbors the most brilliant stars and some of the most spectacular wonders of the deep-sky. They include nebulae, clouds of gas and dust either glowing by their own light or reflecting the light of nearby stars; clusters of stars, both old and young; galaxies far beyond our own Milky Way; multiple stars of surprising beauty; and variable stars that challenge our notion of a constant sky. And if that's not enough, we also have intricate Jupiter in our evening sky and awe-inspiring Saturn in the morning! We will tour the brightest and best telescopic delights of the winter sky, and each object will be paired with a nearby but less-known wonder to tempt the observer with more experience.

15th of December — Wednesday (Sea Day)

8:30am – 10:00am **From Galileo to Apollo: A History of Lunar Exploration**
Gary Seronik — [Hudson]

From the first moment when humans looked skyward, to that historic July day in 1969 when Neil Armstrong set foot on the lunar surface, the Moon has been the object of fascination, fantasy, and wonder. Science's struggle to understand, map, and explore Earth's nearest neighbor is a rich story full of intrigue and colorful characters. Join Gary as he retraces this journey of discovery from Galileo's initial telescopic inspection of the Moon's "rough and unequal surface" to the "magnificent desolation" seen by Apollo astronauts.

10:30am – Noon **Origin of the Moon**
David Stevenson, Ph.D. — [Queens Lounge]

Although there are many ideas for how our Moon came to exist, only one makes sense chemically and physically: The Moon came from a Big Splash, the molten and vaporized rock that is ejected during a giant impact on Earth by a body about the size of Mars. I will describe how this not only explains the Moon but also sets the stage for all of subsequent Earth evolution. For indeed, the nature of our planet is inextricably linked to the existence and nature of our satellite companion.

Noon – 1:30pm LUNCH

1:30pm – 3pm **America the Beautiful at Night**
Wally Pacholka — [Hudson Room]

It's truly amazing the results one can achieve with Landscape Astro-Photography using just a tripod and 35mm camera with a standard lens. Whether you are a novice astro-photographer or an advanced imager, you will be amazed at the simplicity and beauty that you can obtain using basic equipment and a little know-how. Wally's stunning single image photographs of the night sky as seen over America's great parks and landmarks will be presented.

3:30pm – 5pm **Exploring Lunar Landscapes**
Andrew Chaikin — [Queens Lounge]

Tour the Apollo landing sites, and many other lunar wonders, with Andrew Chaikin, author of A Man on the Moon. Learn how the moon's countless craters were formed, how the moon itself came to be. Find out what the Apollo astronauts discovered when they became the only humans to visit this magnificent alien world, and why Chaikin believes our satellite is the solar system's "jewel in the crown."

6:30pm – 7:30pm **Cocktail Party**
[Crow's Nest]

16th of December — Thursday

1pm **Ship Arrives Aruba**

11pm **Ship Departs from Aruba**

8:30am – 10am **The Road Less Traveled**
Susan French — [Hudson]

There comes a time when those who love the night sky become familiar with its well-known denizens and think, "What next?". The celestial vault holds countless unsung telescopic treasures waiting to be explored. They may rest in obscurity because they are listed in some little-known catalog, too large to have been noticed in old narrow-field surveys, or too faint for observers with little experience. We will visit some of the celestial incognita in the winter sky as well as resources for discovering more of these objects and digging up data about them.

10:30am – Noon **Capturing the Light — The Night Sky**
Wally Pacholka — [Hudson]

Given the evolving advances in imaging technology we'll examine how today's generation of amateur astonomers can take stunning images thought impossible just a few years ago. We'll cover all the basic techniques in capturing the night sky: cameras, lenses, exposure times, and camera setting as well as Landscape Astro-Photography equipment that is good, better, and best for the budget imager or cutting-edge imager. By then end of this session you'll understand the difference between what the eye sees and what the camera sees — and how to use this knowledge to make great photos.

17th of December — Friday

8am **Ship Arrives Curaçao**

5pm **Ship Departs from Curaçao**

5:30pm – 7pm **Viewing and Understanding the Moon**
Gary Seronik — [Hudson]

When is the best time to view the Moon? Why do eclipses occur? What kinds of features can I see? Where is the best place to look? These are just some of the questions answered in this talk. But perhaps most rewarding is developing an understanding of what it is you're seeing in your telescope. How did this crater form? Why does it look this way? Why are some parts of the Moon bright, and others dull? Why are some smooth, while other regions a jumble of craters? Equipped with a telescope and armed with the information presented in this talk, you can explore the Moon like a lunar geologist.

18th of December — Saturday (Sea Day)

8:30am – 10am **Capturing the Dark — Illuminating the Landscape**
Wally Pacholka— [Hudson]

Let's face it, astronomers want dark locations to photograph sky events, but if the sky is dark, how does one get the landscape bright enough to show up in the photograph? In this session you'll learn the tricks to illuminating the scenery you are photographing under the dark night sky by using artificial light, cresent moonlight, or ambient city lights.

10:30am – Noon **Mysteries of the Moon**
David Stevenson, Ph.D. — [Queens Lounge]

In many ways our Moon is better understood than any planetary body aside from our home. We have rocks returned by the Apollo astronauts, dated in our labs, and numerous other sources of information about this near neighbor. Nonetheless, there are many mysteries about lunar history and structure ... how the Moon got to the orbit its is now in, how lunar rocks acquired some evidence of an ancient magnetic field, why the inside of the Moon contains small amounts of water, how the Moon is layered and why the Moon may have a small iron core. Despite its rather special and remarkable origin (though a Giant Impact) the Moon has much to tell us about planets in general and we need to continue with robotic exploration.

Noon – 1:30pm LUNCH

1:30pm – 3pm **Gearing Up for a Moon Shot**
Gary Seronik — [Hudson]

The Moon is also one of a handful of astronomical sights that can be enjoyed with just the eyes you were born with, but if you really want to explore the lunar surface, some gear is necessary. With the right stuff, you can inspect the Moon as if you were on your own private spaceship a mere 2,000 kilometers from its surface. As an experienced equipment reviewer and builder, Gary discusses in detail what kinds of optics are best for viewing the Moon. Binoculars, telescopes (small, medium, and large), eyepieces, filters, and other accessories are covered along with their respective pros and cons.

3:30pm – 5pm **Naked-Eye Astronomy**
Susan French — [Queens Lounge]

Contrary to popular opinion, you can enjoy a lifetime of astronomy with little or no equipment other than your unaided eye. Learn to explore the constellations and see colors in the stars. Find out how to spot the International Space Station passing across your sky or watch the brilliant flash of an Iridium satellite. See the Northern Lights dance and catch the swift streak of a "shooting star" as space debris zips through our atmosphere. Know when to look for pretty gatherings of the Moon and planets. Look for Sun dogs, Sun pillars, and radiant crepuscular rays. Enjoy softly glowing lunar halos and coronae. These and many more celestial wonders can be viewed by those who know where and when to look.

6:30pm – 7:30pm **Cocktail Party**
[Crow's Nest]

19th of December — Sunday

5am **Ship Arrives Panama Canal**
(no Cosmic Trails Events on this day)

Enter Panama Canal	**5am**
Gatun Lake, Panama	**9am – 10am**
Exit Panama Canal	**1pm**
Cristobal, Panama	**2pm – 6pm**

20th of December — Monday

6:30am **Ship Arrives Costa Rica**

4pm **Ship Departs from Costa Rica**

4:30pm – 6pm **Apollo Astronaut Experience**
Andrew Chaikin — [Queens Lounge]

Only 24 men have been to the moon. While researching his landmark book, A Man on the Moon, Andrew Chaikin spent more than 150 hours interviewing 23 of the 24 Apollo lunar astronauts about every aspect of their incredible journeys. Chaikin will share anecdotes and insights from this extraordinary handful of men, the only humans to visit another world.

10pm – ??? **TOTAL LUNAR ECLIPSE**
Andrew Chaikin — [Observation Deck]

21st of December — Tuesday (Sea Day)

10:30am – Noon **Planetary Diversity**
David Stevenson, Ph.D. — [Queens Lounge]

We now know that planets are common. I will describe the evidence and explain why this is a natural consequence of how stars form. I will also describe how robotic exploration of our own solar system has led to a view of planets that emphasizes diversity rather than similarity and what this suggests for planets elsewhere. Although there are surely so may planets that some must be like Earth, perhaps the most exciting prospects are for planets and life forms very different from our home.

Noon – 1:30pm LUNCH

1:30pm – 3pm **Exploring the Night Sky with Binoculars**
Gary Seronik — [Hudson]

Just about every one associates stargazing with telescopes — but even the most experienced backyard astronomer owns binoculars. Why? Simply because when it comes to instant observing and being able to enjoy wide fields of view, nothing beats binoculars. But not all binoculars are created equal. Some are stellar performers, while others are strictly for the birds. In this talk Gary tell you how to choose and use binoculars specifically for viewing the night sky. He also describes in detail various tips and tricks to help you get the most out of your viewing experiences. Finally, Gary lists his picks for the top 10 binoculars sights in the entire night sky.

3:30pm – 5pm **The Quest for Mars**
Andrew Chaikin — [Queens Lounge]

Dreamers and space scientists, engineers and biologists, backyard astronomers and artists have devoted their lives — sometimes at the expense of their careers — to the quest for Mars. Andrew Chaikin, who covered Mars exploration as a science journalist and took part in the first Mars landing, chronicled this epic quest and the enduring dream of going there in his book, A Passion for Mars. Chaikin will share the story of Earthbound explorers and their robotic surrogates caught in the irresistible pull of the Red Planet.

6:15pm – 7:15pm **Party! (Cash bar)**
[Crow's Nest]

22nd of December — Wednesday (Sea Day)

10:30am – Noon **Telescopes for Stargazing**
Susan French — [Queens Lounge]

A backyard telescope is a wonderful thing. But with the bewildering variety of equipment available today, it's difficult for the budding astronomer to know what best suits his or her needs. A lot can be done at modest expense, while some fairly expensive telescopes can be quite frustrating. Learn about the different types of telescopes, and what they are best suited for. Find out what accessories are essential, and which can wait. Discover how you can test drive telescopes and some of the equipment that goes along with them, as well as how to look for help when you need it.

Noon – 1:30pm LUNCH

1:30pm – 3pm **Cutting Edge Landscape Astro-Photography**
Wally Pacholka — [Hudson]

Knowing the night sky and knowing planet Earth so you know what to shoot, when to shoot, where to shoot is what this session is all about. We'll also cover advanced imaging like bird's-eye-view panoramics that cover 180 degrees of horizon and sky, as well as some basic image processing and how to avoid doing too much image editing by taking good images to begin with!

3:30pm – 5pm **Origin of Earth**
David Stevenson, Ph.D. — [Queens Lounge]

Our own solar system began as a disk of gas, and dust four and one half billion years ago. From this, emerged our Sun and a set of planets, one of which is our home planet. I will describe our current understanding of this process and how it allowed for the development of an atmosphere, an ocean, plate tectonics, a magnetic field, and conditions for life.

6:15pm – 7:15pm **Party! (Cash bar)**
[Crow's Nest]

SPEAKER PROFILES

Award-winning science journalist and space historian **Andrew Chaikin** has authored books and articles about space exploration and astronomy for more than 25 years. Writer, director, and explorer James Cameron (Titanic, Aliens of the Deep) called him "our best historian of the space age." Chaikin is best known as the author of *A Man on the Moon: The Voyages of the Apollo Astronauts*, widely regarded as the definitive account of the moon missions. First published in 1994, this acclaimed work was the main basis for Tom Hanks' 12-part HBO miniseries, *From the Earth to the Moon*, which won the Emmy for best miniseries in 1998. Chaikin spent eight years writing and researching *A Man on the Moon*, including over 150 hours of personal interviews with 23 of the 24 lunar astronauts (Apollo 13's Jack Swigert was already deceased). Apollo moonwalker Gene Cernan said of the book, "I've been there. Chaikin took me back."

From 1999 to 2001 Chaikin served as Executive Editor for Space and Science at SPACE.com, the definitive website for all things space. He was also the editor of SPACE.com's print magazine, Space Illustrated. Chaikin is a commentator for National Public Radio's Morning Edition, and has appeared on Good Morning America, Nightline, and the NPR programs Fresh Air and Talk of the Nation. He has been an advisor to NASA on space policy and public communications. A former editor of Sky & Telescope magazine, Chaikin has also been a contributing editor of Popular Science and has written for Newsweek, Air&Space/Smithsonian, World Book Encyclopedia, Scientific American, and other publications. A graduate of Brown University, Chaikin served on the Viking missions to Mars at NASA's Jet Propulsion Laboratory, and was a researcher at the Smithsonian's Center for Earth and Planetary Studies before becoming a science journalist in 1980. He is an amateur musician and songwriter; he has also been an occasional space artist, and is one of the founders of the International Association of Astronomical Artists.

Chaikin collaborated with moonwalker-turned-artist Alan Bean to write *Apollo: An Eyewitness Account*, published in 1998 by the Greenwich Workshop Press. He also co-edited *The New Solar System*, a compendium of writings by planetary scientists, now in its fourth edition. His essays include the chapter on human spaceflight in *The National Geographic Encyclopedia of Space*, published in 2004, and Live from the Moon: The Societal Impact of Apollo for NASA's 2007 book *The Societal Impact of Spaceflight.*

Chaikin's newest books, co-written with Victoria Kohl, are Voices from the Moon (Viking Studio) featuring excerpts from his conversations with Apollo astronauts, and *Mission Control, This is Apollo* (Viking Childrens) a book for young readers illustrated with paintings by Apollo moonwalker Alan Bean. Both were published in May 2009. A Passion for Mars was published in September 2008 by Abrams.

Susan French is a leading amateur astronomer and contributing editor for the world's top popular magazine of astronomy, Sky & Telescope. She has been described as "a deep sky nut with too many telescopes."

"I'm an amateur astronomer in the original sense of that word amateur — I do it for the love of it," says French. Her interest in the subject was sparked initially by college physics courses, and renewed when, as a homebound mother, she sought intellectual stimulation and settled on the subject of astrophysics. That led to attendance at local astronomy lectures, and to the meetings of the Albany Area Amateur Astronomers, where Sue met Alan French. "He convinced me to build telescopes, and I convinced him to look through them," she says.The Frenches were married in 1985, and remain leaders of the Amateur Astronomers group.

In addition to currently serving as the chairperson of Albany Area Amateur Astronomers' "Star Party" observing events, Sue French is also Emeritus Trustee of the Board of the Dudley Observatory in Schenectady, the nation's oldest organization dedicated to the support of astronomical research. For many years she ran the Schenectady Museum's planetarium.

Ms. French has gained a worldwide following with her "Deep-Sky Wonders" column in Sky & Telescope. Her expert opinions and tips can also be found in her book, *Celestial Sampler: 60 Small-Scope Tours for Starlit Nights.*

An experienced lecturer, observer, and equipment reviewer **Gary Seronik** has been in the astronomy game for more than three decades. Indeed, he began subscribing to Sky & Telescope magazine in 1973 when he was only 12 years old! In the early 1990's, Gary's passion for sharing the wonders of the night sky eventually lead him to the H.R. MacMillan Space Centre in Vancouver, BC, where he wrote and produced planetarium shows. In 1996 he began writing for S&T and joined the staff full-time as an associate editor in 1998. He is currently a contributing editor.

Gary enjoys a wide range of observing pursuits from studying intricate details on the surface of the Moon to seeking out faint fuzzies at the limits of perception. One of his favorite activities is binocular observing — as regular readers of S&T know from his popular monthly Binocular Highlight column. A compilation of his articles, *Binocular Highlights: 99 Celestial Sights for Binocular Users* has recently been assembled into a highly successful book that has reached #1 in its category at Amazon.com several times.

But when it comes to his absolute favorite telescope target, Gary will quickly tell you that for him, nothing beats the Moon. His lunar observing and imaging skills are put to good use at S&T. Gary served as editor for the new edition of Anton'n Rükl's classic *Atlas of the Moon* and for Charles A. Wood's highly regarded book, *The Modern Moon*. But of all the Moon products he has helped bring to fruition, Gary is proudest of the recently published *Field Map of the Moon,* which he regards as the ideal telescopic companion for dedicated lunatics like himself.

Over the years Gary has ground mirrors for numerous homebuilt telescopes, several of which have appeared in the pages of S&T. His current favorite instrument is a 12.75-inch Dobsonian travelscope, which has already flown with him to a number of far-flung locations, including Costa Rica. His knowledge of optics and equipment serve him well as the author of S&T's Telescope Workshop column and as a reviewer for S&T Test Report.
Gary continues to enjoy exploring the night sky and making telescopes from his home near Victoria, British Columbia. In addition to his on-going contributions to S&T, he has several books in the works (including an observer's guide to the Moon) and writes the On The Moon column for the Canadian astronomy magazine, SkyNews. His web address is www.GarySeronik.com.

When **Wally Pacholka** was nine years old, his parents kept wondering what in the world he was doing up on the roof for all hours of the night. When questioned on the subject, he replied, "I just love looking at the stars, don't you???". He soon found out that not only his family, but most of his friends, didn't have this same interest and fascination with the night sky as he did. He soon set out to change that, by buying a used camera and tripod at a pawn shop with paper route money, to show them some of the fascinating things he was seeing in the night sky, night after night. They and everyone who saw his images were impressed. That was 40 years ago, yet today he is still at it with basically the same type of equipment, a 35mm camera and tripod — however rather than just fascinating close friends, he has fascinated millions with his landscape astro-photography that has graced some of the most prestigious magazines and books in the world. In 1997 when great comet Hale-Bopp made its 13-month naked eye visit to Earth most astronomers and photographers used their longest telephoto lenses and telescopes to capture its beauty in stunning detail. Pacholka took a different approach and used his standard 35mm lens with tripod, yet included terrestrial landscape in each shot with the comet skyscapes above. That technique made Pacholka an instant celebrity with images in major newspapers and magazines worldwide including National Geographic, Encyclopedia Britannia, and the coveted TIME Magazine Picture of the Year.

In 2003 with the 60,000-year-close-encounter-of Mars event, Pacholka set out to achieve the TIME Picture of Year award for that event to prove to himself the 1997 accomplishment was no fluke. He not only made TIME Picture of Year again, but also LIFE Picture of year with a second outstanding image of Mars over landscape scenery.

Currently Pacholka is focused on his photographic series project titled "America the Beautiful at Night" where he is photographing the fascinating night skies over America's key national parks and landmarks. This multi-year project has earned him 35 NASA APOD's, a world record for an individual. Besides an amazing three pages in LIFE's 2009 magazine "Hidden America", S&T's "Beautiful Universe 2009" has seven of his images including the cover image. The just released "Beautiful Universe 2010" with the words "The World's Best Astro-Photography" on the cover has three full two-page spreads of his national park night sky work. All this achieved using a 35mm camera on a basic photographic tripod but with a determination to hike the national parks at night to enable folk to see what he sees, the fascinating night skies that are there night after night. Whether he has given his slide presentations to crowds on the top of Mauna Kea in Hawaii or to folk in Death Valley, he has inspired thousands with the beauty of the night sky and how relatively easy it is to record it using some basic equipment and landscape astro-photography techniques.

To see more of Wally's images, visit his website http://www.AstroPics.com/.