

Rochester Skies

Outreaches



Book Reviews



Sigma Xi Lecture



Word Find Fun

Rochester Astronomy Club Newsletter

Issue #9 Q1 '08



Come Experience
the *Universe*

State of the RAC

By President
Randy Hemann

With two applications for approval pending, the RAC is positioning itself for better financial stability in the years to come. We are anticipating a reply from the IRS regarding our 501(c)(3) by midyear. This of course will allow tax deductible contributions to our treasury. The other application is for our club insurance. With another successful outreach event [see following article] demonstrating great public interest in astronomy, we need to be accountable for the safety of our outreach participants, club members, and the club itself. Interestingly, if I may slightly digress, the historic time line of commercial insurance and the enlightenment of astronomy have some interesting parallels. Follow along!

Introduce John Graunt. He was an English businessman in the 18th century who made his living as a haberdasher, selling buttons and needles. In 1603 the city of London, England began publicly posting all births and deaths. Although Mr. Graunt was neither a mathematician nor a scientist, he became interested in studying these lists and began inferring demographic information that no one else had done before. Among other things he quite accurately

provided the first reliable population estimate of London (384,000), the population density of its people (200 persons per acre), and life expectancy of one born in the city (only 16 years!).

Approximately 30 years after Graunt published this demographic information in his "Natural and Political Observations", another person took a very keen interest in this field of study. This particular person was a mathematician, a scientist, and an astronomer. He attained his most lofty distinction in the field of astronomy for his study of 24 comets that were recorded between the years 1337 to 1698. He asserted that 3 of these comets which appeared in the years 1531, 1607 and 1682 were probably one in the same and boldly predicted when it would return. Edmund Halley astounded the world when his prophesy came true in 1758 upon the return of the comet that bears his name.

Besides his achievements in astronomy, inventing the diving bell, and convincing (and financing) Isaac Newton to publish his "Principia" (which governed the laws of motion for the next 300+ years); he advanced the use of demography by developing the principles of probability and the concept of risk management. For example, what are the odds a 25 year old will live to the age of 50? This allowed him to produce actuary tables that eventually allowed governments to offer annuities, and later, private companies to offer insurance.

So, in the spirit of Edmund Halley, we plan to go forward and acquire insurance for the club that will offer personal and club liability, fire, and medical coverage. We will need to pass this with a quorum vote which we hope to do at the next (March) club meeting. See you there!



Edmund Halley

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Lunar Eclipse Outreach

By D Deal



Lunar eclipse outreach plans were loose, to say the least. Many items were last minute. Whether we were ready or not, the Moon was going to pass through the Earth's shadow on February 20th, an act it wouldn't perform again for nearly three years. It was no matter; the RAC team performed magic by pulling an outreach out of a hat.

The Wednesday of the eclipse was cold all day and evening temperatures dipped below zero. Thanks to our secretary and treasurer (Nicole Edgar and Rebecca Bomgaars), we had great publicity. Community calendars, television news and the Post Bulletin newspaper all had the event covered. Larry Mascotti made a big contribution by allowing us to use Mayo High School as our

outreach location. This gave us and our guests access to a warm shelter and plenty of parking. Also, everybody knows where Mayo High School is, so anybody that ventured out into the cold knew exactly where to find us.

Nicole and Rebecca were very busy. They acquired the electric urns for our beverages and brought treats and other supplies fit for a throng. It took time to set up everything: tables, astronomy information, Starry

Night computer simulation, cookies, coffee and hot chocolate. Electric cables were strung where they were

needed and when everything was turned on—the circuit blew. Another little adventure ensued. Thanks to an early arriving patron who helped untangle a long extension cord, we regained power.

RAC members arrived in numbers, toting telescopes and set them up this way and that. There were at least eight scopes ready to go as Earth's shadow took the first nibble from the Moon.

“Would people show up on a cold night in the dead of winter?”

KTTC came to do a live interview and somehow they got my number. I wonder who did that? Never mind, I know and I'll get even with those two! The news van had a little technical difficulty of their own, so the live feed at 6:00PM slipped by. Steph Anderson came back a bit later and put me in their spotlight. I wasn't sure if I was going to be anxious or nervous, in fact I didn't know what I was going to do. I joked to her that I'd feel much better if they used a 'tall-thin' filter on me. When they turned the camera on



Display with handouts, sign-up sheet, computer with Starry Night simulation software and lots of cups to be filled with hot chocolate.

and she started asking questions, my head flooded with all kinds of things to say, but with just one mouth for an outlet, I hope it was coherent. That interview was actually a lot of fun to do.

The night still held one big question, would people show up on a cold night in the dead of winter?

At first I helped a family with their telescope and then centered my own scope (12" Meade Lightbridge Dobsonian) on Saturn. What a beautiful sight. The rings are closing and Saturn's moons were splayed out, Titan leading the way, followed by Rhea, Tethys, Dione and Enceladus.

I enjoy showing Saturn to people as much as looking at it myself. The opportunity to do so had me excited enough that the cold didn't bother me too much. I did notice the cold when my hand would touch the bare metal of my equipment. Hand warmers sure helped.

Before I knew it, a line had formed at my scope and all the other scopes too. People of all ages came through as the line continued for at least an hour. Thanks to Rebecca, I had a step stool for children who wouldn't otherwise be able to reach the eyepiece with their curious eyes. I really enjoy when a young child peeks through and takes in their

first look at Saturn. I asked one little boy to describe what he saw and he replied, "Wow, it looks just like Saturn!"

On the other end of the spectrum, I was surprised when an elderly woman stepped forward for a look

through the scope. My grandmother sure wouldn't have come out on a night like this—in fact, many people chose to watch the eclipse from inside warm houses. I salute this senior citizen and pray to see her at our next outreach. A lot of people did show up that night and it made an impression on me. I hope I did likewise.

Kirk Severson, our club's Vice President, tallied about 60 people present at one

point. Larry Mascotti guesstimated we had 300 individuals over the entire night. I'm thinking it had to be pretty close to that number. The crowd quickly consumed an urn of hot chocolate followed by a second (although the coffee didn't go as well).

"Wow, it looks just like Saturn"

Thanks again to Rebecca for making a trip to the store to get more hot chocolate and cups. Thanks to Nicole for helping manage the event, the scopes and reminding me to snap shots of the eclipse. Thanks to John Fields for bringing two scopes, Mike Currie and Rick Murray for bringing good sized Dobs. Thanks to Allan Cameron, Kirk Severson, Jeff Newland and Brandon Wyman who aided with optics, knowledge and support. It was also good to see Amanda Lee, a former club officer, visit the event.

You all made me proud to be a member of the Rochester Astronomy Club. A successful outlook like this is what it's all about!



An early arriving guest takes in her very first view of Saturn!

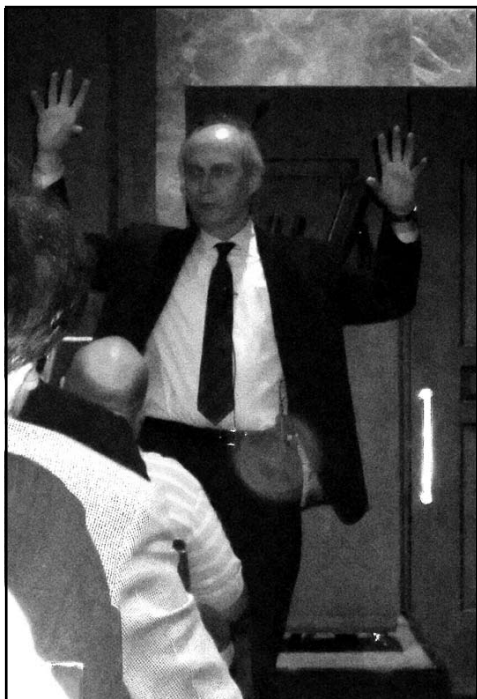
Mike Currie, setup and ready to share his view of the sky with all. Orion 10" Dobsonian Telescope



Sigma-Xi Presents

Michael Turner Ph.D.

By Nicole Edgar



Michael Turner, Ph.D., a Distinguished Service Professor at University of Chicago's Department of Astronomy, is a surprisingly good cartoonist. During his presentation on January 15, 2008 he demonstrated mind-blowing theories of astrophysics using humorous, easy to understand slides and turned an otherwise complicated lecture into a colorful journey through the cosmos. Dr. Turner received his Ph.D. from Stanford University in 1978 and has focused on the application of elementary particle theory in cosmology and astrophysics. His research attempts to answer questions about the earliest moments of the universe, as well as inflation cosmology and the study of dark energy, a term that he himself coined in 1998.

In the famous "deep field" image taken by the Hubble Space Telescope, which makes up only one for-

ty-millionth of the universe, 1,500 galaxies can be counted. Based on this, we can figure that the universe contains 100 billion galaxies. But what we can't see in the image is what makes up the space in between those galaxies, otherwise known as dark matter.

Fritz Zwicky, an American based Swiss astronomer, studied the movement of galaxies in the 30's. He saw that although galaxies in clusters were moving in all different directions, they didn't disperse. Zwicky proposed that the gravity of stars isn't strong enough to hold clusters together, therefore they must be held together by something we can't see – dark matter. Dark matter can't be seen because it doesn't emit or reflect electromagnetic radiation. It gathers in regions, forming a web-like pattern where galaxies and galaxy clusters are formed.

Dark energy is a sort of homogeneous cosmic medium...

Scientists have discovered that only .5% of known mass in the universe is made up of stars and the materials we see every day. 26% of the universe is actually made up of dark matter, and the rest is made up of what is called dark energy. Dark energy is a sort of homogeneous cosmic medium that is elastic and cannot be broken down into smaller particles. Very little is known about what exactly makes up dark energy, but it is thought that repulsive grav-

ity is the driving force behind the increasing expansion of the universe.

In order to theorize what the universe's fate is, such as whether or not it will continue to expand indefinitely in equilibrium, re-collapse under its own weight or fly apart in a big rip, we need to know more about dark energy. One thing can be certain - Dr. Turner is not alone in his search for answers to the universe's biggest questions. He pointed out that if the universe continues to expand forever, there may be a time we will no longer see any stars or galaxies. Therefore now is the time to fund astronomy or, of course join the RAC.

RAC



Michael Turner and Nicole Edgar after his Sigma Xi presentation.

Dark Skies With The Scouts

by Rick Murray

After three cancellations due to cloudy skies, the Pine Island Cub Scouts finally enjoyed a 'Clear Sky Star Party' on Nov. 12. It was a bit brisk, but six scouts and eight parents enjoyed about an hour and a half of gazing at the heavens through a 4.5" Newtonian reflector, an 8" Dobsonian, and a 12" Dobsonian.

We got set up a little late to see the newly crescent Moon and Jupiter, so we started with comet 17P/Holmes. It's coma was still huge, but starting to lose some of its brightness. We set up the 4.5" reflector on the comet for the late-comers and proceeded to move across the sky. The next few targets were open star clusters, moving from the double in Perseus (NGC884 & NGC869), to the Pleiades, and to M11 in Scutum. We then went to M13, a globular cluster in Hercules where we spent some time working the focus to get the full experience.

Starting to feel the chill, we moved on to the Great Andromeda Galaxy with M32 and NGC205 in the same field of view. That proved to be a favorite target. Two double stars were selected for observation, Alberio in Cygnus followed by Zeta UMa. Closing up the show were two planetary nebulae: the Dumbbell (M27) in Vulpecula, and the Ring (M57) in Lyra. After that we observed the Veil Nebula, a supernova remnant in Cygnus. By this time frost was starting to settle on the scopes and we called it a party.

Six weeks earlier, on October 1st, I spent half an hour with the scouts discussing what we would be looking at once we got outside. They remembered quite a bit from the space science class in school from a year ago. I brought some Hubble photos to show them and explained that what we would see wouldn't be quite so spectacular.

We had a very good time at the school soccer field where it was quite clear and dark. We took in a total of 14 deep sky objects. I hope to do this again in the spring with the Girl Scouts... time and place to be announced.

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ASTRONOMICAL SKETCHING

A Step-by-Step Introduction

By Richard Handy, et al.

Review by Scott Regener

The first question that passed through my mind upon seeing the title of this book was, "Why would any modern astronomer sketch?" I still believe it is a legitimate question. It is not, however, a question without an answer. In fact there are many; as many, perhaps, as there are astronomical sketchers.

When a camera was first pointed towards the sky, the first photographic plate drove a stake into the heart of the question: "What is reality?" No longer would the human eye reign supreme in declaring what any astronomical object looked like. While photographs have revealed innumerable details and have permitted us to see more and farther than ever before, none have yet given an exact representation of what the human eye can or should expect to see.

Enter the astronomical sketch which, despite the casualness of the name, can present detail and accuracy to rival the photograph.

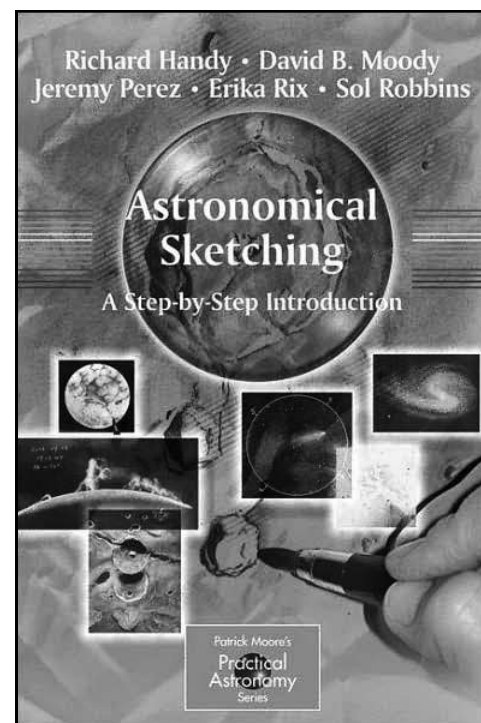
Sketching has a distinct impact upon the observer. A quick glance is insufficient to render details. The methodical approach to recording a sketch also forces concentration on parts of the object that might otherwise be overlooked. A common complaint of beginning sketchers is that a half-finished sketch becomes only a quarter-done as more and more detail becomes apparent. I can imagine no more perfect tutorial for detailed observation than the careful sketch.

Satisfied that sketching has a place in modernity, the next problem lay in believing I could do better than the quick scratchings in my

log book. I am not an artist. I earned poor grades in art classes. Could it really be possible that a thin book could take me to a respectable level in this field?

It took less than ten minutes of reading before I learned of tools and tricks that had held back my progress for years. No longer did the process present impenetrable mysteries. At last, I was convinced. I could do this.

The book itself is deceptively dense, the text portion being only



175 pages. Chock-full of illustrations, the text explains each step in sufficient detail to clarify any remaining confusion. An expert in sketching each type of object prepared a chapter in the book: Moon, Comets, Sun, Planets, Star Clusters (Globular and Open), Nebulae and Galaxies. A weakness emerges from the organization, however: tools and techniques are covered in a scatter-shot manner, often with references to distant parts of the book. I couldn't find any gaping holes, but a concise and coherent approach to sketching in general would be useful.

Perhaps the best part of astronomical sketching is the low cost of entry combined with an assurance that nothing will become obsolete. Any optical equipment - even the naked eye - is sufficient. Tracking mounts are helpful, but not required. I purchased everything I needed to start for under \$20. This book is highly recommended to anyone with even a passing interest in how sketching is done, but is indispensable to anyone who wants to seriously pursue this field.

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M35, My first sketch after reading the book. Although not perfect, I can proudly hold it up and know that it is the work of my own hands and eye.



The Astronomical Winter of Discontent

By Dean
Johnson

Little did I know of, and scarcely did I wonder at the bleak and desolate future awaiting me in the glorious days and nights of last autumn. During my last observing year I had put in a tremendous effort to crack 200 hours of observing in a single year, starting it with a transit of Mercury across the face of the Sun, and ending with Comet 17P Holmes, one of the most spectacular and unusual comets to ever grace our night sky.

But as I started my next observing year, a sinister sequence of events began to unfold, trapping me under cloudy, cold skies, burying my favorite observing site with ever greater amounts of snowfall and leaving me to withdraw into my last place of refuge, my library,

reluctantly becoming an armchair astronomer.

At first the change was gradual. My last few observing sessions were short efforts to observe Comet Holmes tucked into the lee of my house, avoiding both the tearing wind and the hated clutches of the three streetlights that surround my home. Then came December and the first snowfall, followed by more and soon the dark sky window of late November and early December was gone. No chance to follow Comet Holmes across the starry fields of Perseus, and now the first half of Mars opposition was gone as well.

On Christmas night, traveling home from my sister's house, Mars stood shining in the sky, a great red

beacon, simply magnificent. Then after we returned to our house, the clouds followed in our footsteps and a brief chance to observe was gone.

January merely deepened winter's icy, cloudy grip and the passing of the chance to see Comet 8P Tuttle as it traveled through Cassiopeia, Andromeda, Triangulum and down into Cetus only reinforced the growing awareness that this was becoming a serious observing drought.

I was missing the dwarf planet Ceres as it too, traveled through Cetus. The Geminid meteor shower was something I could only read about on the Internet, and while the skies opened for a brief opportunity to view the Moon slicing through the top of the Pleiades on January

17/18, the temperatures stood below zero with wind chills at -30° . Discretion was the better part of valor that night.

Doggedly I tried to keep my spirits up. I reread Burnham's *Celestial Handbook* for the third time. My issues of *Sky & Telescope* and *Astronomy* were welcome diversions to the long nights of listening to the wind howl outside my library window. Daily I perused the web sites of Astronomy Picture of the Day, Universe Today and Space.com and occasionally checked out the JPL web sites.

I kept track of the RAC via the forum and e-mail to Duane and others. But alas, my one dependable winter cold showed up for the night of the January meeting and the February meeting was the victim of another storm, keeping me house-bound once again.

But all was not lost. On January 27th, I made it down to the Flatin Farm to take a stab at seeing Asteroid TU24 which was making its close approach to the Earth. Hazy

skies and a very low magnitude kept me from seeing it, but just to be out there again was a tonic.

Comet Holmes was near Algol, but so faint as to be nearly invisible. I got a good observation on Mars and could only appreciate the lost visions that had escaped me above the clouds over the past two months. But I viewed some old favorites and made progress towards an observing goal by bagging two Binocular Deep Sky Objects before the clouds once again chased me home.

Progress is a good thing and by going over my observing logs page by page, I found that I have credible observations on seven comets. Twelve comets are needed for a silver certificate and pin from the astronomical league. I also searched Burnham's for a new project, the observation of long term variable stars with large swings in magnitudes. There are twenty-one available to observers throughout the calendar year.

As I was putting up my Binocular Messier certificate during the

Viking's last game against Denver, I was struck by the Vikings similarity to catastrophic variable stars, stellar objects that display long periods of boring inactivity broken up by brief but interesting outbursts of energy.

It was an outburst of observing energy that graced our passion for astronomy on the night of the Lunar eclipse. Braving the cold, but having the saving grace of little to no wind, lots of us got out to see one of the best shows by the Sun, Earth and the Moon in a long time. Seeing the darkened lunar disk bracketed by Saturn and Regulus was a very special treat. I was out there for six hours and finally felt like my long winter's observing slump was coming to an end.

My mirrors are collimated, my oculars are clean and shiny, repairs have been made. Once again, I'm ready for the skies to clear and temperatures to mellow. I'm ready to be an armchair astronomer no more.

RAC

BIG BANG

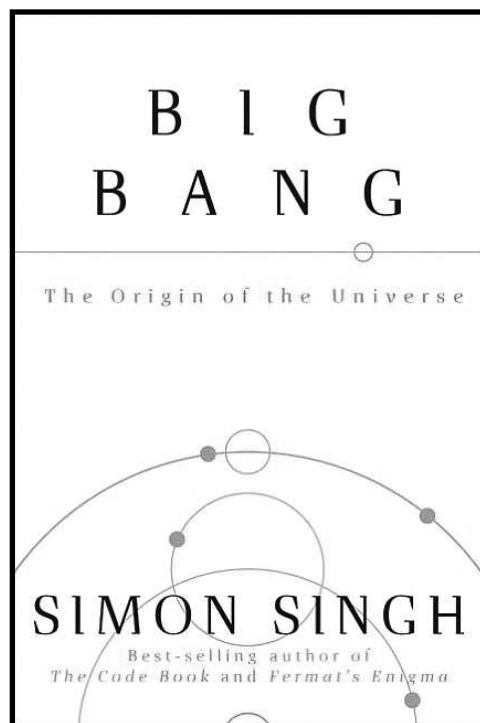
The Origin of the Universe

By Simon Singh

Review by Kirk Severson

I found Big Bang to be a very readable book. Singh's journalistic treatment of scientific theory and observation is such that you can quickly read through and get a good understand the historical progression of the science of Cosmology and get to know both the well-known and the lesser-known contributors. Or, you can slow down and grapple with each of the heavy concepts one by one as they come up. In a few places I felt there were gaps in the support for how we know what we know which required a leap of faith, but for the most part this narrative of the history of Astronomy and Cosmology weaves a seamless thread from early concepts of the nature and origin of the universe to the most recent evidence in support of... well, you saw the title.

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RAC Lunch

Astronomy - Cosmology - Podcasts - WIMPS - Nothing

The best part of the Rochester Astronomy Club is the people. We don't need videos, guest speakers and presentations or anything else to have an educational and meaningful meeting. Those things are all great, but there is a time to let the structured aspect fall to the wayside so we can just share with each other.

The idea was borrowed from the K-Lug group. K-Lug is a club that meets and discusses Linux and related topics. They meet at RCTC just like the RAC does, but they have had an additional lunch meeting for a very long time. If they can do it, why not us?

On Friday, February 29th, 2008, eight members of the RAC met for our very first casual lunch meeting. We had eight members that met at the Apache Mall food court. Some individuals used the opportunity to eat lunch, while others just joined for the intriguing conversation. The beauty of the meeting is the lack of structure. It allows members the freedom to discuss whatever comes to mind and at the

same time get to know each other better.

What did we talk about? Nothing. No really, we discussed nothing. That needs some clarification—how areas with less nothing fill areas with more nothing; in other words we discussed the pressure of particles. In space there are particles just like on Earth, but about a quintillion times less. There's not only nothing between particles but also a whole lot of nothing between the constituents that make up particles. Our discussion proved that we knew a lot about nothing and everybody learned about nothing from it.

In addition to nothing, we also discussed astronomy podcasts, cosmology, quantum physics and WIMPs (Weakly Interacting Massive Particles). It was rather ironic that a couple kids in the food court had a short brawl right when we began talking about WIMPs.

That was far from the extent of the conversations and several continued simultaneously around the table—so

there was no lack of interesting topics.

The first RAC lunch was a great success and we plan on having many more. If you can join us for a discussion, or if you're just hungry, stop by and bring your questions, answers and appetite to the table.

Future RAC lunches will be hosted on the third Wednesday each month.

Thanks to everybody who made it and I look forward to seeing more people at the next meeting, where we'll talk about something.

...bring your questions, answers and appetite..



RAC Lunch attendees from lower left, clockwise: Jeff Newland, Alan Cameron, Dan Strain, Duane Deal, Kirk Severson and Nicole Edgar. Also present but not photographed was Scott Regener and behind the camera, Jonathan Fields.



Invisible Spiral Arms

by Patrick L. Barry

At one time or another, we've all stared at beautiful images of spiral galaxies, daydreaming about the billions of stars and countless worlds they contain. What mysteries—and even life forms—must lurk within those vast disks?

Now consider this: many of the galaxies you've seen are actually much larger than they appear. NASA's Galaxy Evolution Explorer, a space telescope that "sees" invisible, ultraviolet light, has revealed that roughly 20 percent of nearby galaxies have spiral arms that extend far beyond the galaxies' apparent edges. Some of these galaxies are more than three times larger than they appear in images taken by ordinary visible-light telescopes.

"Astronomers have been observing some of these galaxies for many, many years, and all that time, there was a whole side to these galaxies that they simply couldn't see," says Patrick Morrissey, an astronomer at Caltech in Pasadena, California, who collaborates at JPL.

The extended arms of these galaxies are too dim in visible light for most telescopes to detect, but they emit a greater amount of UV light. Also, the cosmic background is much darker at UV wavelengths than it is for visible light. "Because the sky is essentially black in the UV, far-UV enables you to see these very faint arms around the outsides of galaxies," Morrissey explains.

These "invisible arms" are made of mostly young stars shining brightly at UV wavelengths. Why UV? Because the stars are so hot. Young stars burn their nuclear fuel with impetuous speed, making them hotter and

bluer than older, cooler stars such as the sun. (Think of a candle: blue flames are hotter than red ones.) Ultraviolet is a sort of "ultra-blue" that reveals the youngest, hottest stars of all.

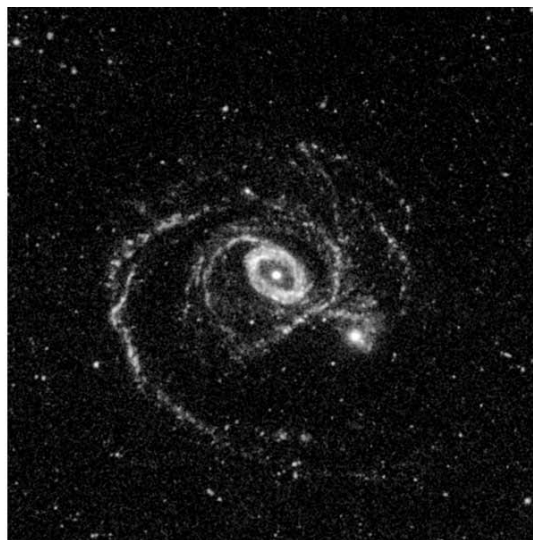
"That's the basic idea behind the Galaxy Evolution Explorer in the first place. By observing the UV glow of young stars, we can see where star formation is active," Morrissey says.

The discovery of these extended arms provides fresh clues for scientists about how some galaxies form and evolve, a hot question right now in astronomy. For example, a burst of star formation so far from the galaxies' denser centers may have started because of the gravity of neighboring galaxies that passed too close. But in many cases, the neighboring galaxies have not themselves sprouted extended arms, an observation that remains to be explained. The Galaxy Evolution Explorer reveals one mystery after another!

"How much else is out there that we don't know about?" Morrissey asks. "It makes you wonder."

Spread the wonder by seeing for yourself some of these UV images at www.galex.caltech.edu. Also, Chris Martin, principle scientist for Galaxy Evolution Explorer—or rather his cartoon alter-ego—gives kids a great introduction to ultraviolet astronomy at spaceplace.nasa.gov/en/kids/live#martin.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Left Image: Galaxy's appearance in visible light.

Right Image: Invisible long spiral arms as they appear in ultraviolet light.

RAC

Constellation Word Find

ANDROMEDA	CENTAURUS	FORNAX	MUSCA	SCULPTOR
ANTLIA	CEPHEUS	GEMINI	NORMA	SCUTUM
APUS	CETUS	HERCULES	OCTANS	SERPENS CAPUT
AQUARIUS	CHAMAELEON	HOROLOGIIUM	OPHIUCHUS	SERPENS CAUDA
AQUILA	CIRCINUS	HYDRA	ORION	SEXTANS
ARA	COLUMBA	HYDRUS	PAVO	TAURUS
ARIES	COMA BERENICES	INDUS	PEGASUS	TELESCOPIUM
AURIGA	CORONA AUSTRALIS	LACERTA	PERSEUS	TRIANGULUM
BOOTES	CORONA BOREALIS	LEO	PHOENIX	TRIANGULUM AUSTRALE
CAELUM	CORVUS	LEO MINOR	PICTOR	TUCANA
CAMELOPARDALIS	CRATER	LEPUS	PISCES	URSA MAJOR
CANCER	CRUX	LIBRA	PISCIS AUSTRINUS	URSA MINOR
CANES VENATICI	CYGNUS	LUPUS	PUPPIS	VELA
CANIS MAJOR	DELPHINUS	LYNX	PYXIS	VIRGO
CANIS MINOR	DORADO	LYRA	RETICULUM	VOLANS
CAPRICORNUS	DRACO	MENSA	SAGITTA	VULPECULA
CARINA	EQUULEUS	MICROSCOPIUM	SAGITTARIUS	
CASSIOPEIA	ERIDANUS	MONOCEROS	SCORPIUS	

A L I U Q A Y P Q Z L S J A X T E L E S C O P I U M N S D G P R A A
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 N O Q U U T J I A I M C E A M H C S A Z S G A R D B S O N E N O V I
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 W T U P A C S N E P R E S I F M Y N I B T M G L S U N T W O U F Z Y
 S L E P U S P I N L W O M V T Y S A T O J I R T U L Y P R J H S H P
 A L U C E P L U V R X O F D G N D C T I Z N I P Y O Y K Z E Q R I D
 M W J A D U A C S N E P R E S R C Z A H J I V F E C G A N E C R P N
 U T R C A X Y C I R C I N U S U B B L R O N I M S I N A C M G A O K
 O I U R S A M A J O R C O R O N A A U S T R A L I S B M B W V X L G

Rochester

*Newsletter of the
Rochester Astronomy Club*

Skies



Star Party <i>Observing at Eagle Bluff</i>	April 4 *
Club Meeting <i>Under the Sky</i>	April 8 *
NCRAL <i>Port Washington, WI</i>	Apr 18-19
Star Party <i>Observing at Eagle Bluff</i>	May 2 *
Astronomy Week <i>Mayo High School Outreach</i>	May 9 *
Astronomy Day <i>Join us for a Dark Sky Outreach</i>	May 10 *
Club Meeting <i>Under the Sky (If at first you don't succeed...)</i>	May 13 *
Star Party <i>Observing at Eagle Bluff</i>	June 6 *
StarBQ <i>South of the border star party to remember</i>	June 27 *
Independence Day Outreach <i>Silver Lake</i>	July 4 *
AlCon '08 <i>Des Moines, IA</i>	July 18-19

*Events subject to change due to weather. Please check up-to-date resources for details.

Rochester Astronomy Club
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