

NCA Events This Month

The Public is Welcome!

NCA Home Page: <http://capitalastronomers.org>

Fridays, April 4, 11, 18, & 25, 6:30 to 9:30 P.M., NCA Telescope-making Classes at the Chevy Chase Community Center, at the northeast corner of the intersection of McKinley Street and Connecticut Avenue, N.W. Contact instructor Guy Brandenburg at 202-635-1860 or email him at gbrandenburg@yahoo.com.

Fridays, April 4, 11, 18, & 25, 8:30 P.M. Open nights with NCA's 14-inch telescope at Ridgeview Observatory near Alexandria, Virginia. For more information, see below.

Saturday, April 26, 8:30 P.M. Exploring the Sky at Rock Creek Park. See Page 4.

Saturday, April 12, 3:00 P.M. NCA meeting in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane, (Second Floor), Bethesda, MD.

Dr. Alycia Weinberger will give the featured talk, "Planet Formation"

See map and directions on Page 6.

Saturday, April 12, following the meeting, dinner with the speaker and NCA members at Bacchus 7945 Norfolk Avenue Bethesda, MD 301-657-1722 (Lebanese food)

Dr. Alycia Weinberger's Talk

(Continued from page 1)

Biography

Alycia Weinberger has been a staff researcher at the Carnegie Institution of Washington's Department of Terrestrial Magnetism since 2001. She earned her Bachelor's degree in physics from the University of Pennsylvania in Philadelphia and her Ph.D. in physics from the California Institute of Technology in Pasadena. She was a postdoctoral scholar at UCLA, first as a member of the Hubble Space Telescope near-infrared camera (NICMOS) science team and then as a NASA Astrobiology Institute postdoctoral fellow. In 2000, she was awarded the Annie Jump Cannon prize by the American Association of University Women and American Astronomical Society for significant research by a female postdoctoral scholar. In 2002, she was awarded the Vainu Bappu Gold Medal by the Astronomical Society of India for her work.

Alycia specializes in observations of circumstellar disks and almost always observes in the infrared part of the spectrum, at wavelengths from 1 - 20 microns. She admits that she has never met a big telescope she doesn't like. However, her trusty 4-inch Astroscan, bought with the prize money from an 8th grade science competition, often travels with her to dark skies around the country (yes, it fits under the seat in front of you on an airplane!).

Observing with the NCA C-14

Bob Bolster

Fridays at 8:30 p.m.

April 4

April 11

Bring SLR camera, slow-medium speed film.

T Adapters for Nikon, Canon, Olympus, Praktica available.

April 18

April 25

Prime Objects

Jupiter, Saturn, M44

Lunar photography workshop, 10-day Moon

Jupiter, Saturn

Jupiter, Saturn, M44

At Ridgeview Observatory in Bob Bolster's backyard, 6007 Ridge View Drive, Franconia, Virginia (off Franconia Rd. between Telegraph Rd. and Rose Hill Dr.). Call Bob at 703-960-9126 before 6:00 p.m., to let him know you are coming.

Star Dust is Now Available Electronically

Any member wishing to receive *Star Dust*, the newsletter of the National Capital Astronomers, via e-mail as a PDF file attachment, instead of hardcopy via U.S. Mail, should contact Nancy Grace Roman, the NCA Secretary, at nancy.roman6@verizon.net or 301-656-6092 (home).

The deadline for the May Star Dust is April 15. Please send your material to Elliott Fein by that date to ensure inclusion.

Send submissions to Elliott Fein at elliott.fein@erols.com.

Text must be in ASCII, MS Word (97 or earlier), or WordPerfect.

All articles submitted may be edited to fit the space available.

Support the IDA

Join the International
Dark-Sky Association

3225 N. First Avenue Tucson, AZ
85719-2103

www.darksky.org

Review of talk by Dr. Marc A. Murison, continued

(Continued from page 1)

through it with a minimum of reflection;

- An Orion “Shorty Plus” Barlow lens (~\$60) for magnification;
- A Lumicon LumiBrite diagonal to bend the light and the remaining accessories back towards the telescope to promote stability;
- A 1” spacer and a 4.5” spacer to transition between the diagonal and the interference filter;
- An Edmund Optics 82 Angstrom (FWHM) interference filter (~\$150) centered on 5200 Angstroms which limits the range of wavelengths passing through this filter, thus eliminating chromatic aberration. The fact that this CCD chip’s maximum spectral response was also 5200 Angstroms was the primary reason for selecting this filter; and
- A CCD camera constructed from a Philips Vesta 675K webcam (~\$40), two CPU fans and a Radio Shack project box.

The CCD

The Philips Vesta CCD chip possesses characteristics that are exceptionally responsive for astronomical observing. The CCD has a pixel array of 659 x 494 where each pixel is 5.6 microns, a fairly small pixel size. The CCD interpolates and compresses this image slightly to output 8-bit 640 x 480 JPG files in RGB or 256-level grayscale, a process which introduces artifacts which must be accounted for later in image processing. The 256-level grayscale limit defines the chip’s dynamic range and its most severely limiting design characteristic.

Unfortunately, Philips no longer manufactures this webcam. Used webcams can still be found on www.eBay.com and other webcam manufacturers also make good devices. Yahoo groups like Quick Cam and Unconventional Imaging in Astronomy (<http://groups.yahoo.com/group/QCUIAG/>) are good places to look for recommendations.

The Camera

In its original state the webcam was unsuitable for mounting to a telescope eyepiece, so Dr. Murison built a camera mounting. He removed the CCD chip from

the webcam and mounted it in an inexpensive Radio Shack project box. He added two CPU fans to keep the chip cool as well as the required ports for communication and power.

Mounting the camera to the eyepiece required the greatest precision. Failing to mount the CCD chip array perpendicular to the telescope’s optical axis would result in blurred images. Dr. Murison attached an aluminum plate with three set-screws and springs to the Radio Shack box to which the CCD circuit board was epoxied. Guided by the diffraction grid produced by a laser collimator (or a laser pointer), Dr. Murison adjusted the CCD to within 2.1 arc minutes of perfect alignment, well within the limits required for clear imaging.

Preparing Your Equipment

To produce high quality solar images:

- Suppress reflections that can wash out images with too much light by coating the interior of the telescope tube, eyepiece, and accessories with a non-reflective material. The black adhesive backed material used to prevent slipping on exterior stairs is ideal for this purpose. It is inexpensive and readily available in hardware stores. To achieve the best results, spray paint this material with Krylon flat black paint.
- Minimize blurring by aligning your eye pieces and accessories.
- Minimize undesired telescope movement by using anti-vibration pads under the legs of your tripod. Dr. Murison used Celestron pads (~\$50) purchased from Orion.

Observing Strategies

Even with the best equipment you will end up with poor results unless you:

- Plan your observing sessions during times when the atmosphere is calm. The best time is usually in the morning, before the ground has had a chance to heat up and create turbulence. Buildings and especially parking lots can be exceptionally disruptive heat sources.
- Keep your exposure times short, on the order of millisecond or less, to limit the amount of light and to minimize the effects of turbulence. Typically

webcam drivers control the exposure duration. An important feature to look for is whether or not your webcam permits you to specify exposure times in tenths or hundredths of a millisecond.

- Over-sample your image to account for artifacts caused by CCD image interpolation and compression. Dr. Murison noted that a setting of between 0.15 to 0.25 arc seconds/pixel works best for his setup.
- Take video instead of single exposures. Clear seeing can last for just a fraction of second. It’s better to take video that captures about 10 frames per second and delete all except the best images later, bearing in mind that on a good seeing day where atmospheric turbulence is at a minimum, you will still end up throwing out about 97% of the images that you have taken.

Processing Your Images

Dr. Murison did not spend a lot of time on image processing, since this topic is a separate lecture all of its own. He noted that he used a Pentium II 700-MHz laptop with 2 to 4 Gb of available disk space, a modest configuration by today’s ever improving standards. Below is an abbreviated summary of his image processing procedure:

- Make an initial quick pass through your image set and throw out the poor ones.
- Make a second more detailed pass through your image set and pick out the best ones. It’s easier to do these first two steps separately than all at once.
- Preprocess each image at double its size, 1280 x 960, perform a Gaussian blur to remove compression artifacts, and, finally, increase the contrast. Take great care in the preprocessing stage, because excessive image processing errors will be magnified in the final processing stage.
- Process the final image by shrinking it back to its original size, 640 x 480, increase its sharpness, and selectively process areas to bring out more detail.

The Results

Dr. Murison presented still images and videos showing remarkable detail of sun

(Continued on page 4)

National Dark Sky Week

What is National Dark Sky Week?

During National Dark Sky Week everyone in the United States turns off outdoor lighting to temporarily reduce light pollution so we can step back for a moment and realize the wonder that our universe holds. NDSW will inspire us to use better lighting systems such that they emit only a small amount of light in the atmosphere. National Dark Sky Week was founded not only to reduce light pollution, but to connect with the night sky. It occurs from April 1 to April 8 10 p.m. to Midnight (ET & MT) and 9 p.m. to 11 p.m. (CT & PT)

What is Light Pollution?

Light Pollution is the glow in the atmosphere as a result of outdoor lighting that intervenes the beauty of the universe. It screens out everything beyond Earth's atmosphere and blankets all of the greatness of what lies beyond our physical reach.

What happens if National Dark Sky Week succeeds?

If National Dark Sky Week succeeds, then light pollution will be reduced and the beauty of the universe will be revealed.

The night sky has long been forgotten by many and NDSW will give us all a chance to forget about our Earthly distractions for a few hours, a chance to look up and be humbled by the vast universe, and a chance to realize that our

Earth is not alone; it lies among other wondrous astronomical features.

Important Information

When observing the night sky during NDSW, it is a good idea to stay in a large group of people in a safe, dark location.

To participate in National Dark Sky Week, spread the word, turn out your lights during your given times, and see the the greatest show the universe has to offer from a safe location.

Other options for NDSW include going to star parties and observatories. You may find out what events are going on in your area by newspaper and listening for opportunities on the television or radio. Visit the Organization Guide at www.astronomy.com for events in your area.

Send questions or comments to: NationalDarkSkyWeek@yahoo.com.

Review of Dr. Murison's Talk

(Continued from page 3)

spots and the solar surface, including several wide-field views with multiple images tiled together. To see for yourself, visit his web site at <http://arnold.usno.navy.mil/murison/>. Click on the "Miscellaneous" link and select "Amateur Astronomy > Solar and Planetary Images". There you will not only be treated to spectacular images, but you will also be able to learn more about his equipment.

NCA is grateful for Dr. Murison for an exceptional presentation. The passion that he expressed for his work will inspire others to follow in his foot steps.

Come See the Stars! by Joe Morris

Exploring the Sky 2002-2003 Schedule

Date	Time	Notes
4/26	8:30 P.M.	Lyrid meteor shower peaks 4/22
5/24	9:00 P.M.	Astronomy Day 5/10
6/7	9:00 P.M.	Quarter moon. Summer solstice 6/21
7/19	9:00 P.M.	
8/23	8:30 P.M.	Perseid meteor shower 7/17-8/24
9/27	8:00 P.M.	Rock Creek Park Visitor Day
10/18	7:30 P.M.	
11/15	7:00 P.M.	Leonid meteor shower 11/14-11/21

Exploring the Sky is an informal program that for nearly fifty years has offered monthly opportunities for anyone in the Washington area to see the stars and planets through telescopes from a location within the District of Columbia.

Sessions are held in Rock Creek Park once each month on a Saturday night from April through November, starting shortly after sunset. We meet in the field just south of the intersection of Military and Glover Roads NW, near the Nature Center. A parking lot is located immediately next to the field.

Beginners (including children) and experienced stargazers are all welcome—and it's free!

Questions? Call the Nature Center at (202) 426-6829 or check the Internet sites:

<http://www.nps.gov/rocr/planetarium>
<http://www.capitalastronomers.org>

Meteor Showers April Radiants

Full Moon: April 16

Major Activity

Radiant	Duration	Maximum
Lyrids (LYR)	April 16-25	April 22@22:00UT

Minor Activity

Radiant	Duration	Maximum
Tau Draconids	March 13-April 17	March 31-April 2
Librids	March 11-May 5	April 17/18
Delta Pavonids	March 21-April 8	April 5/6
Pi Puppids (PPU)	April 18-25	April 23/24
April Ursids	March 18-May 9	April 19/20
Alpha Virginids	March 10-May 6	April 7-18
April Virginids	April 1-16	April 7/8
Gamma Virginids	April 5-21	April 14/15

Daylight Activity

Radiant	Duration	Maximum
April Piscids	April 8-29	Apr. 20/21

Source: <http://comets.amsmeteors.org/meteors>

Mid-Atlantic Occultations and Expeditions

by David Dunham

Asteroidal Occultations

Date	Day	EDT	Star	Mag	Asteroid	dmag	dur. Ap.		Location
Apr 10	Thu	2: 42	TAC+12d3000	10. 8	Olga	3. 4	6	7	wVA, w&sN. Car.
Apr 14	Mon	22: 44	ACRS 536481	11. 6	Euryanthe	3. 5	4	8	n. N. Carolina
Apr 25	Fri	0: 42	TYC13861001	11. 5	Nora	4. 6	3	8	Wash. DC area
Apr 28	Mon	0: 20	SA0 117258	9. 5	Merope	6. 6	5	4	s. Quebec
Apr 30	Wed	3: 32	TAC+2d 8673	11. 7	Undina	0. 7	10	8	S. Carolina

Lunar Grazing Occultations

DATE	Day	EST/ EDT	Star	Mag	% alt	CA	Location
Apr 3	Thu	19: 47	SA0 092910	8. 8	4+ 6	6S	Laurel & e. Beltsville, MD
*** Dates and times above are EST; those below are EDT ***							
Apr 6	Sun	18: 59	SA0 076729	6. 9	21+ 46	1S	Cape Henlopen, DE Sun alt. -6d
Apr 7	Mon	21: 52	SA0 077399	8. 4	31+ 25	5N	FallsChurch, VA & Waldorf, MD
Apr 13	Sun	4: 33	46 Leonis	5. 4	83+ 6	0N	Gaithersburg to Greenbelt, MD
Apr 26	Sat	6: 04	ZC 3363	8. 8	22- 15	2S	Boonsboro, MD; Sun alt. -3
May 11	Sun	21: 35	nu Vir	4. 0	77+ 57	11N	Westminster & Reisterstown, MD

Total Lunar Occultations

DATE	Day	EDT	Ph	Star	Mag	% alt	CA	Sp.	Notes
Apr 6	Sun	22: 43	D	SA0 076777	8. 5	23+ 17	77N	G0	Azimuth 287 deg.
Apr 7	Mon	23: 04	D	SA0 077441	8. 2	31+ 23	67N	A0	Double, mg. 10. 4, 2. 4"
Apr 7	Mon	23: 14	D	SA0 077455	8. 1	31+ 21	84N	A0	
Apr 7	Mon	23: 30	D	ZC 0867	6. 8	32+ 19	41N	B1	
Apr 8	Tue	0: 12	D	SA0 077513	7. 7	32+ 11	62S	K0	Az. 293 deg.
Apr 10	Thu	2: 16	D	SA0 079610	7. 2	52+ 8	77N	F8	Az. 296 deg.
Apr 11	Fri	20: 45	D	ZC 1390	7. 7	71+ 70	75N	G0	
Apr 12	Sat	23: 01	D	SA0 099091	7. 3	81+ 63	61N	G5	Db., mag2 9. 6, sep. 2"
Apr 12	Sat	23: 23	D	42 Leonis	6. 2	81+ 61	9S	A1	Graze, CA -8S, Richmond
Apr 13	Sun	2: 40	D	ZC 1535	6. 9	82+ 27	77N	K0	\star above = ZC 1514
Apr 13	Sun	20: 32	D	SA0 099505	7. 5	89+ 48	8N	K2	Sun -10; terminator 5"
Apr 15	Tue	1: 20	D	ZC 1758	6. 9	96+ 48	32S	G5	
Apr 15	Tue	22: 21	D	48 Vir	6. 6	99+ 37	24S	F0	ZC 1875; terminator 2"
Apr 21	Mon	5: 42	R	ZC 2650	4. 7	72- 24	43N	K3	Sun alt. -8 deg.
Apr 21	Mon	5: 44	R	SA0 186606	7. 2	72- 24	65S	M1	Sun alt. -8 deg.
Apr 23	Wed	5: 48	R	ZC 2965	7. 2	51- 22	86S	G2	Sun alt. -7 deg.
Apr 24	Thu	5: 06	R	ZC 3102	7. 0	41- 15	88N	A0	Double? Az. 136 deg.
May 3	Sat	21: 40	D	ZC 0688	6. 8	5+ 6	67N	F2	Az. 294; mg2. 10, sep2"
May 11	Sun	21: 28	D	nu Vir	4. 0	77+ 58	23N	M0	ZC 1702; graze Baltimore

Phone the IOTA occultation line, 301-474-4945, for updates,
or check the local IOTA Web site at <http://iota.jhuapl.edu>
David Dunham, e-mail dunham@erols.com, phone 301-474-4722

Getting to the NCA Monthly Meeting

Saturday, April 12

3:00 P.M. - NCA Meeting in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane (2nd Floor), Bethesda, MD.

Dr. Alycia Weinberger will give the featured talk, "Planet Formation".

Following the meeting, dinner with the speaker and NCA members at

Bacchus
7945 Norfolk Avenue
Bethesda, MD
301-657-1722
(Lebanese food)

Directions to the Meeting Place in the Bethesda-Chevy Chase Regional Services Center of Montgomery County, 4805 Edgemoor Lane, (Second Floor), Bethesda, MD.

From North of Bethesda

1. Take Rockville Pike/MD-355 South.
2. Rockville Pike/MD-355 S becomes MD-355/Wisconsin Ave.
3. Shortly after Cheltenham Dr. (and one block before reaching Rt. 410), turn right onto Commerce Lane.
4. Commerce Lane becomes Edgemoor Lane.
5. After crossing Old Georgetown Rd., 4805 is the second entrance on the right. (See **M** on map.)
6. To get to public parking, continue on Edgemoor Lane, which will make a sharp right turn. The parking garage is then on your right. See note below.

From South of Bethesda

1. Take MD-355/Wisconsin Ave. North.
2. Turn slight left onto MD-187/Old Georgetown Rd.
3. Turn next left onto Edgemoor Ln. 4805 is the second entrance on the right. (See **M** on map.)
4. To get to public parking, continue on Edgemoor Lane, which will make a sharp right turn. The parking garage is then on your right.

Note: there are two parking lots. The one on Woodmont is for the apartments and may have a fee. The one on Edgemoor is marked "Public" and does not charge on week-ends.

Directions to the Restaurant

Because Woodmont Ave. is one-way Southbound coming out of the parking garage, we are offering you what may appear to be circuitous, but is actually a fairly efficient way of getting to the restaurant after the NCA meeting

1. Following the meeting, turn left out of the parking garage. If you are on Woodmont Ave., turn left at the next intersection, which is Edgemoor Lane.
2. Continue on Edgemoor Lane to Old Georgetown Road.
3. Turn left on Old Georgetown Rd. and then turn right on Woodmont Ave.
4. Turn slight left onto Norfolk Ave.
5. Go four blocks to the corner of Norfolk and Del Ray.
6. The restaurant is on the right side of Norfolk. Look for the red awnings.



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National Capital Astronomers, Inc.

Jay H. Miller, NCA President, jhmiller@os2bbs.com, 301-530-7942 (home).

Gary Joaquin, NCA Vice-president, glj1@erols.com, 703-750-1636 (home).

Dr. Nancy Grace Roman, NCA Secretary, nancy.roman6@verizon.net, 301-656-6092 (home).

Jeffrey Norman, NCA Treasurer, jbnorman2@aol.com, 5410 Connecticut Avenue, NW, Apt. #717,
Washington, DC 20015-2837.

Trustees: Jeff Guerber, Dr. Andrew W. Seacord, II, Dr. Wayne H. Warren, Dr. Harold Williams

NCA Webmaster, Dr. Harold Williams, hwilliam@mc.cc.md.us, 301-650-1463 (planetarium), 301-565-3709 (home).

Elliott Fein, NCA *Star Dust* Editor, elliott.fein@erols.com, 301-762-6261 (home), 5 Carter Ct. Rockville, MD 20852-1005.

NCA Web Page: <http://capitalastronomers.org/>.

Appointed Officers and Committee Heads: Exploring the Sky - Joseph C. Morris; Meeting Facilities - Jay H. Miller;

Observing - Robert N. Bolster; Telescope Making - Guy Brandenburg; Travel Director - Sue Bassett; *Star Dust* Editor - Elliott Fein

SERVING SCIENCE & SOCIETY SINCE 1937

NCA is a nonprofit, membership-supported, volunteer-run, public-service corporation dedicated to advancing astronomy, space technology, and related sciences through information, participation, and inspiration, via research, lectures, presentations, publications, expeditions, tours, public interpretation, and education. NCA is the astronomy affiliate of the Washington Academy of Sciences. All are welcome to join NCA.

SERVICES & ACTIVITIES:

Monthly Meetings feature presentations of current work by researchers at the horizons of their fields. All are welcome; there is no charge. See monthly *Star Dust* for time and location.

NCA Volunteers serve in a number of capacities. Many members serve as teachers, clinicians, and science fair judges. Some members observe total or graze occultations of stars occulted by the Moon or asteroids. Most of these NCA members are also members of the International Occultation Timing Association (IOTA).

Publications received by members include the

monthly newsletter of NCA, *Star Dust*, and an optional discount subscription to *Sky & Telescope* magazine.

Consumer Clinics: Some members serve as clinicians and provide advice for the selection, use, and care of binoculars and telescopes and their accessories. One such clinic is the semiannual event held at the Smithsonian Institution National Air and Space Museum.

Fighting Light Pollution: NCA is concerned about light pollution and is interested in the technology for reducing or eliminating it. To that purpose, NCA is an Organization Member of the International Dark Sky Association (IDA). Some NCA members are also individual members of IDA.

Classes: Some NCA members are available for educational programs for schools and other organizations. The instruction settings include star parties, classroom instruction, and schoolteacher training programs that provide techniques for teaching astronomy. NCA sponsors a telescope-making class, which is described in the *Star Dust*

"Calendar of Monthly Events".

Tours: On several occasions, NCA has sponsored tours of astronomical interest, mainly to observatories (such as the National Radio Astronomy Observatory) and to the solar eclipses of 1998 and 1999. Contact: Sue Bassett wb3enm@amsat.org

Discounts are available to members on many publications, products, and services, including *Sky & Telescope* magazine.

Public Sky Viewing Programs are offered jointly with the National Park Service, and others. Contact: Joe Morris. joemorris@erols.com or (703) 620-0996.

Members-Only Viewing Programs periodically, at a dark-sky site.

NCA Juniors Program fosters children's and young adults' interest in astronomy, space technology, and related sciences through discounted memberships, mentoring from dedicated members, and NCA's annual Science Fair Awards.

Fine Quality Telescope, 14-inch aperture, see "Calendar of Monthly Events".

Yes! I'd like to join the NATIONAL CAPITAL ASTRONOMERS

Date:

Name(s): _____

Address: _____

Telephone: _____ E-mail: _____

Other family members who should receive a membership card: _____

Dues:

___ \$57 With *Star Dust* and a discount subscription to *Sky & Telescope*.

___ \$27 With *Star Dust* ONLY.

___ \$45 Junior membership with *Star Dust* and a discount subscription to *Sky & Telescope*.

___ \$15 Junior membership with *Star Dust* ONLY.

___ \$100 Contributing member (with *Sky & Telescope*) (\$43 tax-deductible).

___ \$150 Sustaining member (with *Sky & Telescope*) (\$93 tax-deductible).

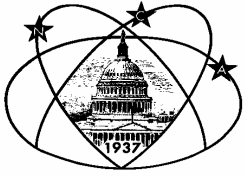
Junior members only: Date of Birth: _____ Only members under the age of 18 may join as juniors.

Tax deductible contribution: _____ Thank You.

_____ I prefer to receive *Star Dust* by e-mail.

Please send this form, with your check payable to National Capital Astronomers, Inc., to:

Mr. Jeffrey Norman, NCA Treasurer, 5410 Connecticut Ave NW #717, Washington DC 20015-2837



National Capital Astronomers, Inc.

If undeliverable, return to
NCA c/o Nancy Roman
4620 N. Park Ave., #306W
Chevy Chase, MD 20815-4551

**FIRST CLASS
DATED MATERIAL**

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