The Prairie Astronomer

October, 2010 Volume 51, Issue #10

The Official Newsletter of the Prairie Astronomy Club

October Program

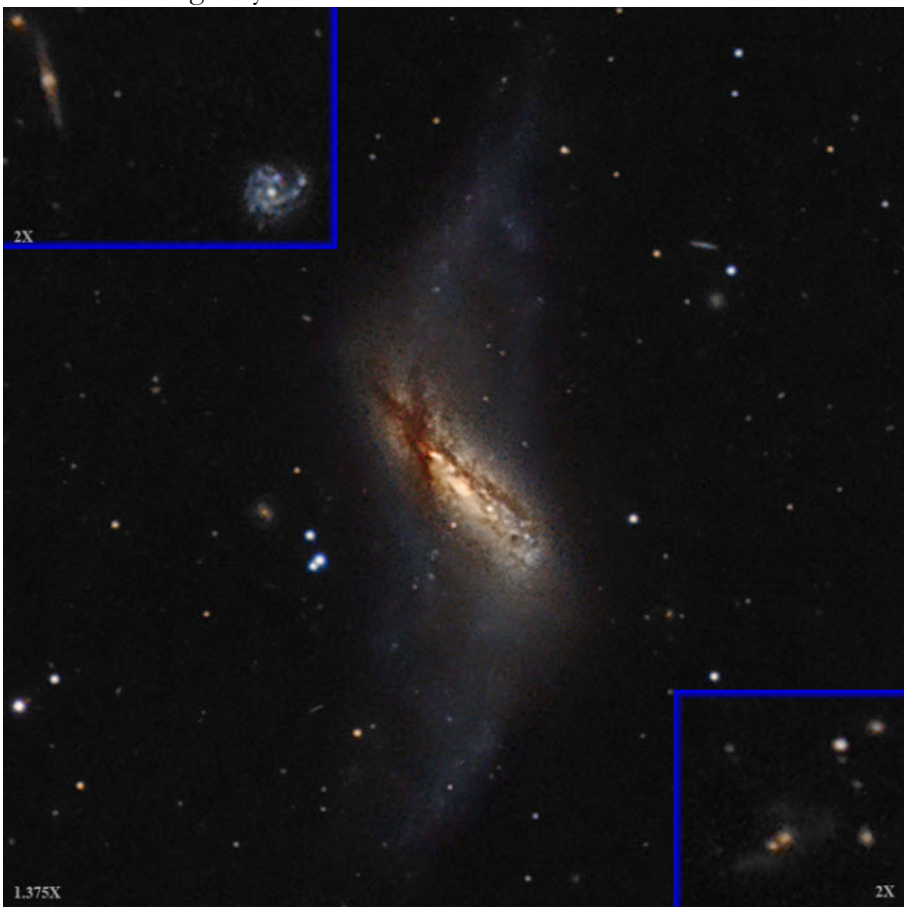
Flying in Microgravity

This program will recount the experiences of UNL Engineering students participating in research as part of NASA's Microgravity University. The UNL group was one selected to fly their experiment last April in NASA's famous "Vomit Comet" aircraft used for training astronauts in the conditions they will experience in space.
For more info:
http://engineering.unl.edu/current-students/microgravity/

In This Issue:

Featured Photo

NGC 660 - By Rick Johnson
NGC 660 is a classic polar ring galaxy located in eastern Pisces near M74. Its distance seems a bit uncertain. It certainly is close by. Red shift isn't very reliable at close range like this. It puts it about 26 million light years distant. NED shows three Tully-Fisher determinations that put it at 38, 43 and 48 million light years. If the red shift distance is used the full extent of the galaxy is only about 40 thousand light years, one third the size of our galaxy.



Club Business

August 31st, 2010 PAC Meeting
Announcements:
Dan Delzell called the meeting to order.

The next PAC star parties will be on Oct 1st and the 8th.

There will be a lunar party on September 15th.

The next PAC meeting will be Tuesday October 26th, 7:30 PM at Hyde.

Outreach upcoming events

Homestead Halloween – October 23th.

Hyde Saturday nights.

Laserfest 2010 at Mueller Planetarium on Oct 8 2010.

50th anniversary of the laser.

Volunteer at Hyde

We are looking for Volunteers .

Why?

The Public is interested

It's fun.

Be a part of something that most cities don't have.

Observing Report

Stare parties

Sept. 3rd 9 attendees and 9 scopes.

Sept. 10th 2 attendees / cloudy.

Sept. 17th 3 attendess.

Evening planets in September include Venus, Mars.

Night Planets in September include Jupiter, Uranus, and Neptune.

Comet 103P/Hartey2 is in the sky also at night.

Upcoming Programs will be

Microgravity Team from UNL for the October meeting

How to buy a telescope in November

Social event for Families of Club members in December at Morrill Hall

We held nominations for officers.

Dan Delzell – President

Jason Noelle – Vice President

Brett Boller – Secretary

Bob Kacvinsky – Treasurer

Dave Churilla – Program Chair/ 2nd Vice President

Brett Boller
Secretary
Prairie Astronomy Club

PAC Board Meeting Minutes–Brett Boller

PAC Board Meeting Oct. 12, 2010
Dan Delzell brought the meeting to order.
The communications coordinator will be Jason Noelle.
Possible new outreach coordinators could be Cal Beard, Chris.
Jason Noelle will try and help with boy scouts that are interested in earning their badges.
Meeting attendance.

Disappointing

Contact people to come to meetings

Send survey again.

Write-up of upcoming meeting topics in newsletter.

Joint meeting between PAC and OAS were discussed and seems like a good idea.
Upcoming presentations
How to buy a telescope.

November meeting will be at 7:00pm

Brian S. Intro 15-20 min.

Bob K. Accessories 10 min.

Dave C. Benefits of joining the club 5 min.

Telescopes.com what you can get for your money 10 min.

-Buy ad for newspaper.

Galileo scopes for children

Door prizes for next meeting.

Other Business

TV ad or show on public access tv

Place a PAC link on HYDE'S website.

The sign outside of Hyde could say what the upcoming programs are.

Brett Boller
Secretary
Prairie Astronomy Club

Club Events

Newsletter submission deadline, November 20, 2010

PAC Club Meeting
Tuesday, October 26, 2010 7:30pm @ Hyde Obsv.
Program: The UNL Microgravity Research Team

Homestead Halloween – October 30th.

PAC Club Meeting
Tuesday, November 30, 2010 7:30pm @ Hyde Obsv.
Program: How to Buy a Telescope

PAC Club Meeting
Tuesday, December 28, 2010 7:30pm @ Mueller Planetarium
Program: Family pot-luck and Planetarium show at Mueller Planetarium on the UNL campus

PAC Club Meeting
Tuesday, January 25, 2011 7:30pm @ Hyde Obsv.
Program: How to use your telescope

PAC Club Meeting
Tuesday, February 22, 2011 7:30pm @ Hyde Obsv.
Program: Speaker John Rhienert, club member and engineer who was part of the Shuttle engine design team.

2010 PAC Star Party Dates

November Oct 29th & 5th
December 3rd & 10th

2010 PAC Lunar Party Dates

November 12th

Volunteer Activities

Homestead National Monument Halloween on the Prairie – Sat. before Halloween
Hyde Observatory on Saturday nights

Additional volunteer events will occur when they are scheduled.

ON THE NET

PAC:
www.prairieastronomyclub.org

PAC E-Mail:
info@prairieastronomyclub.org

NSP:
www.nebraskastarparty.org

NSP E-Mail:
info@nebraskastarparty.org

OAS
www.OmahaAstro.com

Hyde Observatory
www.hydeobservatory.info

Panhandle Astronomy Club
Panhandleastronomyclub.com

PAC-LIST: You may subscribe to the PAC listserv by sending an e-mail message to: imailsrv@prairieastronomyclub.org. In the body of the message, write "Subscribe PAC-List your-email-address@your-domain.com"

For example:
Subscribe pac-list me@myISP.com

To post messages to the list, send to the address

pac-list@prairieastronomyclub.org

PAC can also be found on Twitter and Facebook.

Buy club apparel through the club website. Shirts, hats, mugs, mouse pads and more.

November Observing: What to View--Jim Kvasnicka

By Jim Kvasnicka

This is a partial list of objects visible for the upcoming month.

Planets
Venus: Look for it 25 minutes before the sunrise in the east to start the month.
Saturn: Rises just before daybreak to start the month and by 2 am to end the month.
Mars: Disappearing in the sunset glow. It won't be a naked eye object until spring.
Neptune: In Capricornus, look for a small blue disk.
Jupiter: Bright at magnitude -2.7 with a 45" disk.
Uranus: 3.5° NE of Jupiter.
Mercury: Low in the southwest after sunset, just 6° above the horizon.

Meteor Showers
Leonids: Peaks on the morning of November 17th and 18th, with the waxing gibbous Moon setting a couple of hours before dawn. Last year the rate was 25 per hour.

November Messier List
M27: The Dumbbell Nebula in Vulpecula.
M30: Class V globular cluster in Capricornus.
M56: Class X globular cluster in Lyra.
M57: The Ring Nebula in Lyra.
M71: Class XII globular cluster in Sagitta.
M72: Class IX globular cluster in Aquarius.
M73: Y shaped asterism in Aquarius.
Last Month: M11, M16, M17, M18, M24, M25, M26, M55, M75
Next Month: M2, M15, M29, M31, M32, M39, M110

NGC and Other Deep Sky Objects
NGC 253: The Silver Coin Galaxy in Sculptor.
NGC 288: Galaxy 1.8° SSE of NGC 253 in Sculptor.
NGC 457: The E.T. Cluster in Cassiopeia.
NGC 7662: The Blue Snowball, planetary nebula in Andromeda.

Double Star Club List
Iota Trianguli: Yellow primary with a pale blue secondary.
Gamma Arietis: Equal white pair.
Lambda Arietis: Yellow and pale blue stars.
65 Piscium: Pair of equal yellow stars.
Psi 1 Piscium: Equal bluish white pair.
Zeta Piscium: White primary with a yellow secondary.
Alpha Piscium: Alrisha, close pair of white stars.
Gamma Andromedae: Almach, gold and greenish blue stars.

Challenge Object
IC 289: PN in Cassiopeia, look for a pale 35" grey disk with uniform brightness.

Astronomy Trivia Question:

Just after New Moon, we can faintly see the part of the Moon that is still in shadow. What famous person is the first one known to recognize that this is from "earthshine"?

The answer is on page 7.

Focus On Constellations - Jim Kvasnicka

Cassiopeia

Cassiopeia the Queen has the familiar "W" or "M" pattern superimposed over the brilliant star field of the Milky Way. Cassiopeia is a rather modest constellation with 600 square degrees. It is especially rich in open clusters that range from tiny groups of stars embedded in rich star fields making them difficult to see to some of the finest open clusters in the sky. The constellation has an assortment of planetary nebulae, a few galaxies, and some colorful double stars. Cassiopeia contains two Messier objects in M52 and M103, both open clusters. Cassiopeia is a circumpolar constellation best seen in the month of November.

Mythology and History

In Greek mythology, Cassiopeia and Cepheus were the king and queen of Ethiopia, the parents of the Princess Andromeda. Cassiopeia was very vain and boasted that she was more beautiful than the Sea Nymphs. This upset Poseidon the God of the Sea who sent the terrible sea monster Cetus to destroy their land. The only way Poseidon would spare their land was if Cassiopeia and Cepheus offered their daughter Andromeda as a sacrifice to Cetus. They chained Andromeda to the rocky shore and as the sea monster Cetus was getting closer down flew Perseus on Pegasus who killed the sea monster, rescued Andromeda, and married her.

Objects Magnitude 12.0 and Brighter

Galaxies: NGC185, NGC147, NGC278

Open Clusters: M52, M103, Stock2, Cr463, Cr33, NGC457, NGC129, NGC654, Mel15, NGC7789, NGC1027, Cr34, NGC7654, Stock5, Tr3, NGC225, Mrk6, NGC683, NGC581, NGC659, Tr1, NGC637, King14, NGC7790, Stock24, NGC189, NGC436, Harvard21, NGC433, NGC146, NGC381, NGC7788, NGC133, NGC559, NGC743, Berk62, Berk58, King21, NGC103, Stock6, Berk65, King16, King4, Berk4, IC166, NGC609, NGC366, NGC281, IC1805, IC1848, Czernik3, Czernik13

Globular Clusters:

Planetary Nebula: IC1747, IC289

Bright Nebulae: NGC7635

SNREM:

Dark Nebulae:

Named Stars: Shedir (Alpha), Caph (Beta), Ruchbah (Delta), Segin (Epsilon), Achird (Eta), Marfak (Theta)

Number of Objects in Various Observing Clubs

Messier Club: 2 objects

Double Star Club: 2 objects

Herschel 400 Club: 16 objects

Globular Cluster Club: 0 objects

Open Cluster Club: 16 objects

Planetary Nebula Club: 2 objects

Urban Club: 8 objects

ANNUAL MEMBERSHIP

REGULAR MEMBER - $30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - $35.00 per year. Same as regular member except gets 2 votes at club meetings.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

Club Telescopes

To check out one of the club telescopes, contact **Jason Noelle**. If you keep a scope for more than a week, please check in with Jason once a week, to verify the location of the telescope and how long you plan to use it. The checkout time limit will be two weeks, but can be extended if no one else has requested use of a club scope.

Focus on Outreach–Dave Churilla

This year's Outreach event at the Spring Creek Prairie was cancelled due to overcast skies, sprinkles and the threat of rain. Hopefully we'll be able to participate again next year. Thanks to those who had volunteered to help.

I'd like to make another plea for people to volunteer at Hyde. Finding help is getting problematic and it would be shame if we couldn't open the facility on some Saturday nights for lack of help. We're not there yet, but we could use more volunteers. It's not hard at all…everyone in the club could do as it doesn't really take a lot of experience and an experienced club member is usually scheduled to help. So please, consider volunteer now.

As I mentioned in the last Newsletter we are considering holding our Astronomy Class again next year. We skipped them this year because of the extensive work most of us were involved with in holding the MSRAL Convention. If you think you'd like to give help out please let me know and I'll keep your name listed for those helping out on the classes. I know this seems early but if we want to hold the class in the spring we'll need to start planning soon.

Here's what's coming up for Outreach in the future. Remember that if for some reason you can't make it to an event DON'T just assume we've got plenty of people and not show up. Please let someone know so the event organizer can be kept informed and if necessary find a replacement.

Hyde Observatory: *Saturday nights*. If you are not already volunteering, please consider doing so. It's not hard and can be a lot of fun and we really do need the help. So contact Steve Lloyd today and start volunteering.

Homestead National Monument's Howling Halloween: *Saturday, October 23rd 6 pm to 9 pm*. This is the Federal Park's Open house and is geared toward kids and their parents and is usually held the Saturday before Halloween. This year it is on October 23 from 6 pm to 9 pm. Six people have volunteered to help out at the event: Dan Delzell, Bob Kacvinsky, Cal Beard, Jason Noelle, Jim Kvasnicka and John Lammers. If anyone else would like to help out let Dan Delzell know. This event attracts over 400 people but in small groups of 15 to 20 and is west of Beatrice. We'll usually gather about an hour ahead of time for this one so that we can fill out their volunteer forms then be led to the viewing area and set up.

PAC Beginners Field Class: *To be determined – likely in the spring of 2011*. With the MSRAL Convention behind us we'll once again be holding our Beginner's Field Class next year, likely in the spring of 2011. This class is open to the public and if memory serves me right (and it probably does NOT) we try to hold it on two consecutive Friday's at Hyde Observatory in hopes of getting a clear night on at least one evening. While we do try to cover some basic "classroom" astronomy, the emphasis is on field observing such as identifying constellations, how to use binoculars, how to read star charts, a basic introduction to equipment and an introduction to using telescopes. We can use lots of help such as speakers, setting up scopes for students to learn with, working with students outside, etc. We'll be working with Jack to coordinate this class with Astronomy Day so they don't conflict.

New Club Member's Instructional Class: *To be determined*. As mentioned above we hope to hold informal instructional "classes" for new members who are interested in field observing to help them get started and to answer questions they have. More information to come.

What if you're contacted for Outreach? If you are contacted for an Outreach Activity and want to handle it yourself, that's great – I don't need (nor want) to be involved with every event that we do. I do, however, ask that you let me know about it and afterward send me information about the event so I can track and log it. I need:

Event Name
Event Location
Organization
Contact Name and Information (phone, email, etc)
Volunteers (and who organized)
Event Date & Time – include set up time – so we can track volunteer hours
What you did (i.e. Set up scopes, did presentation or a talk, etc.)

Answer to trivia question on page 4: Leonardo da Vinci

Time for a Change – Jason Noelle takes over as Newsletter Editor

–Mark Dahmke

I had to check old newsletters to remember when I started as editor – I officially took over as newsletter editor in November, 2001. That was 107 newsletters ago! I took over from Jeff King, who did an excellent job as newsletter editor. At that time I was working on a major redesign of the PAC website, and we decided to transition from being primarily a printed newsletter to an online newsletter. We encouraged club members to opt out of receiving a printed edition, to save postage, and instead receive an emailed PDF file.

How I became the newsletter editor:
One day I emailed Jeff to ask if he could send me the latest newsletter as a Word document so I could put it on the website. He emailed back and said "thanks for taking over the newsletter, here it is!" [This is a cautionary tale for future newsletter editors and other unsuspecting club volunteers :-)].

For the first few months, I printed it, took it to Office Depot, ordered 50 copies, picked them up and hauled them across town to Liz Bergstrom. She would print the labels and take care of mailing them. Now I build the newsletter using PagePlus, a desktop publishing package, generate the PDF file and upload it to the website, then send out the email announcements and print five copies on my color laser printer. There are still four club members (you know who you are!) who still receive a printed copy, plus I send a complimentary copy to Terry Genrich at Lincoln Parks and Recreation.

I've enjoyed being the newsletter editor, and would like to thank all the club members who contributed articles. Sometimes it is a challenge to come up with material for each issue, so please help support Jason as he takes over as editor. Articles don't have to be long–just write about your latest astronomy-related project, send in an observing report, an outreach event report or contribute a photo.

Planet Hunters no Longer Blinded by the Light

UA astronomers have developed a way to see faint planets previously hidden in their star's glare. The new mode enables scientists to search for planets closer to the star than has been previously possible.

By Daniel Stolte, University Communications, University of Arizona, October 14, 2010

Using new optics technology developed at the University of Arizona's Steward Observatory, an international team of astronomers has obtained images of a planet on a much closer orbit around its parent star than any other extrasolar planet previously found.

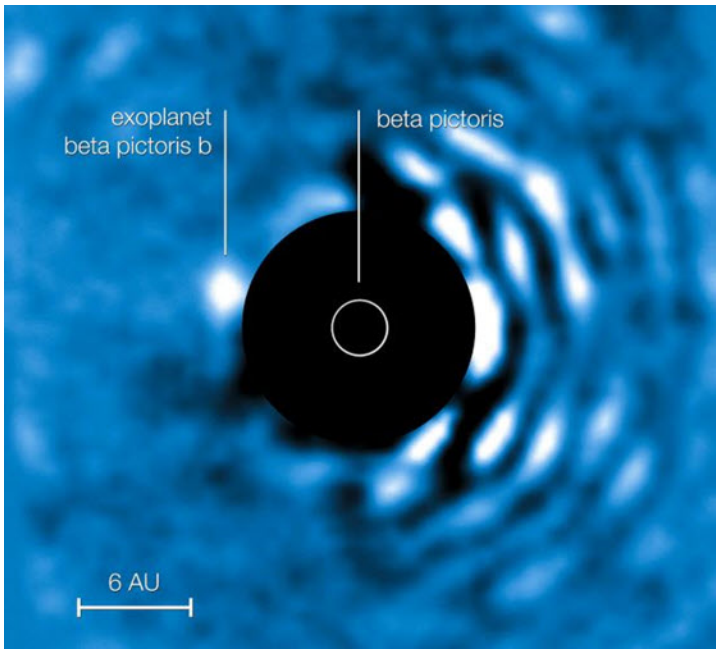
The discovery, published online in Astrophysical Journal Letters, is a result of an international collaboration among the Steward Observatory, the Swiss Federal Institute of Technology Zurich, the European Southern Observatory, Leiden University in the Netherlands and Germany's Max-Planck-Institute for Astronomy.

Installed on the European Southern Observatory's Very Large Telescope, or VLT, atop Paranal Mountain in Chile, the new technology enabled an international team of astronomers to confirm the existence and orbital movement of Beta Pictoris b, a planet about seven to 10 times the mass of Jupiter, around its parent star, Beta Pictoris, 63 light years away.

At the core of the system is a small piece of glass with a highly complex pattern inscribed into its surface. Called an Apodizing Phase Plate, or APP, the device blocks out the starlight in a very defined way, allowing planets to show up in the image whose signals were previously drowned out by the star's glare.

"This technique opens new doors in planet discovery," said Phil Hinz, director of the UA's Center for Astronomical Adaptive Optics at Steward Observatory. "Until now, we only were able to look at the outer planets in a solar system, in the range of Neptune's orbit and beyond. Now we can see planets on orbits much closer to their parent star."

In other words, if alien astronomers in another solar system were studying our solar system using the technology previously available for direct imaging detection, all they would see would be Uranus and Neptune. The inner planets, Mercury, Venus, Earth, Mars and Saturn, simply wouldn't show up in their telescope images.



The planet Beta Pictoris b imaged using the Apodizing Phase Plate coronagraph. The "bad" (bright) side of the image is visible to the right while the central bright regions of the central star (Beta Pictoris) have been masked out to enable the viewer to clearly see the planet to the left of the star. (Image: ESO)

To put the power of the new optics system in perspective: Neptune's mean distance from the sun is about 2.8 billion million miles, or 30 Astronomical Units, or AUs. One AU is defined as the mean distance between the sun and the Earth.

The newly imaged planet, Beta Pictoris b, orbits its star at about seven AUs, a distance where things get especially interesting, according to Hinz, "because that's where we believe the bulk of the planetary mass to be in most solar systems. Between five and 10 AUs."

While planet hunters have used a variety of indirect methods to detect the "footprints" of extrasolar planets – planets outside our solar system – for example the slight gravitational wobble an orbiting planet induces in its parent star, very few of them have been directly observed.

According to Hinz, the growing zoo of extrasolar planets discovered to date – mostly super-massive gas giants on wide orbits – represents a biased sample because their size and distance to their parent star makes them easier to detect.

"You could say we started out by looking at oddball solar systems out there. The technique we developed allows us to search for lower-mass gas giants about the size of Jupiter, which are more representative of what is out there."

He added: "For the first time, we can search around bright, nearby stars such as Alpha Centauri, to see if they have gas giants."

The breakthrough, which may allow observers to even block out starlight completely with further refinements, was made possible through highly complex mathematical modeling.

"Basically, we are canceling out the starlight halo that otherwise would drown out the light signal of the planet," said Johanan (John) Codona, a senior research scientist at the UA's Steward Observatory who developed the theory behind the technique, which he calls phase-apodization coronagraphy.

"If you're trying to find something that is thousands or a million times fainter than the star, dealing with the halo is a big challenge."

To detect the faint light signals from extrasolar planets, astronomers rely on coronagraphs to block out the bright disk of a star, much like the moon shielding the sun during an eclipse, allowing fainter, nearby objects to show up.

Using his own unconventional mathematical approach, Codona found a complex pattern of wavefront ripples, which, if present in the starlight entering the telescope, would cause the halo part to cancel out but leave the star image itself intact. The Steward Observatory team used a machined piece of infrared optical glass about the size and shape of a cough drop to introduce the ripples. Placed in the optical path of the telescope, the APP device steals a small portion of the starlight and diffracts it into the star's halo, canceling it out.

"It's a similar effect to what you would see if you were diving in the ocean and looked at the sun from below the surface," explained Sascha Quanz from the Swiss Federal Institute of Technology's Institute for Astronomy, the lead author of the study. "The waves on the surface bend the light rays and cause the sky and clouds to appear quite different. Our optic works in a similar way."

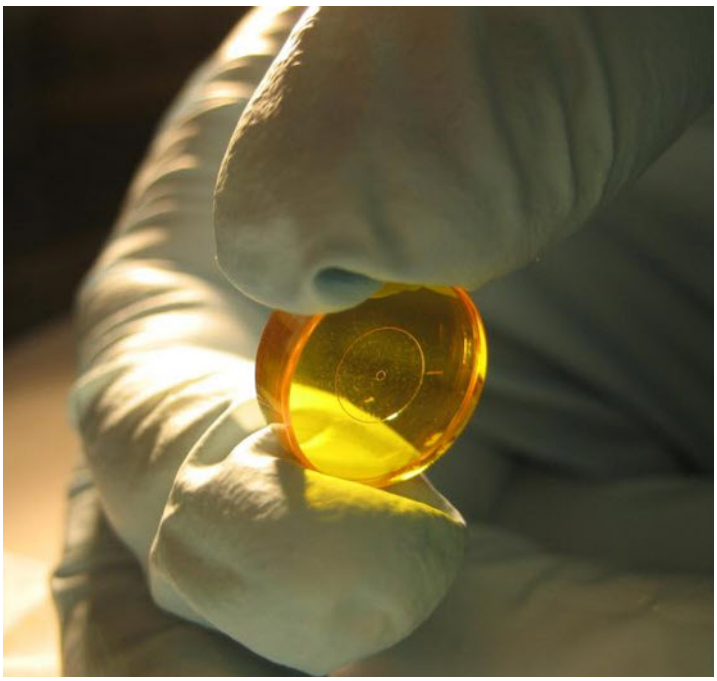
In order to block out glare from a star, conventional coronagraphs have to be precisely lined up and are highly susceptible to disturbance. A soft night breeze vibrating the telescope might be all it takes to ruin the image. The APP, on the other hand, requires no aiming and works equally well on any stars or locations in the image.

"Our system doesn't care about those kinds of disturbances," Codona said. "It makes observing dramatically easier and much more efficient."

In the development of APP, Codona was joined by Matt Kenworthy (now at Leiden Observatory in the Netherlands). Hinz, who is a member of the instrument upgrade team for the VLT, played a key role in the technique's implementation at the MMT Observatory on Mount Hopkins in southeastern Arizona.

Former UA astronomy professor Michael Meyer, now at the Swiss Federal Institute of Technology Zurich, where he led the group implementing the technology on the VLT, pointed out that APP is likely to advance areas of research in addition to the hunt for extrasolar planets.

"It will be exciting to see how astronomers will use the new technology on the VLT, since it lends itself to other faint structures around young stars and quasars, too."



Right: Similar in size and shape to a cough drop, the Apodizing Phase Plate (APP) causes light waves coming from a star to interfere with each other, exposing the faint glow of a nearby planet. Shown here is an early version.

THE *Prairie Astronomy Club*

Amateur Astronomy --
A Hobby as Big as the Universe

The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc. Membership expiration date is listed on the mailing label. Membership dues are: **Regular $30/yr, Family $35/yr**. Address all new memberships and renewals to: **The Prairie Astronomy Club, Inc., PO Box 5585, Lincoln, NE 68505-0585**. For other club information, please contact one of the club officers listed to the right. Newsletter comments and articles should be submitted to: **Mark Dahmke, PO Box 80266, Lincoln, NE 68501 or mark@dahmke.com,** no less than ten days prior to the club meeting. The Prairie Astronomy Club meets the last Tuesday of each month at Hyde Memorial Observatory in Lincoln, NE.

The Prairie Astronomer
c/o The Prairie Astronomy Club, Inc.
P.O. Box 5585
Lincoln, NE 68505-0585

FIRST CLASS MAIL

{MM:TITLE} {MM:FIRSTNAME}
{MM:MIDDLENAME} {MM:LASTNAME}
{MM:CAREOF}
{MM:ADDRESS1}
{MM:CITY} {MM:STATE}, {MM:ZIP}

{MM:RENEWALDATE}

Next PAC Meeting
TUESDAY
October 26, 2010
7:30 PM
Hyde Observatory