



# Sky Watcher

The Newsletter of the Boise Astronomical Society

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## Table of Contents

<b>Letter from the President</b> .....	1
<b>Star Dates</b> .....	2
<b>Binocular Strolls</b>	
A MARCH BINOCULAR STROLL.....	3
<b>NASA Space Place</b>	
WHERE DID ALL THESE GADGETS COME FROM?! .....	6
<b>Welcome to BAS</b> .....	8

## Letter from the President

The next meeting of the BAS Board will be on Tuesday, 03 March at 7 p.m. in classroom #2 at DCI. Immediately prior to that meeting at 6:30 we will be holding an ISP planning meeting for 2009. All BAS members are invited to attend either or both of these meetings.

The next monthly membership meeting will be on Friday, 13 March at 7 p.m. at the Whittenberger Planetarium at the College of Idaho in Caldwell (note change in venue!). The program will be about the equinoxes and solstices along with the morning and evening planets. There will be a \$2/person charge for those attending. BAS will pick up this fee for all of our members. There is limited seating available (~50 max) and BAS members will get priority. The planetarium is NOT ADA-compliant. For directions, check out the files listing at the BAS1 Yahoo! group (<http://tech.groups.yahoo.com/group/BAS1/files/>).

If you have not yet paid your 2009 membership dues, we have removed you from the active membership list and you won't receive the monthly newsletter or any other benefits until you renew. We strongly encourage you to submit your dues and maintain your membership. If you don't recall if you've renewed your membership, check your e-mail to see if you got this month's newsletter.

As a reminder, if you have an Albertson's Preferred Savings Card and would like to link BAS to your list of community partners, we have detailed instructions available under the files section at the BAS1 Yahoo! group. Note that if you've linked your card in the past, you will need to reauthorize it to continue helping BAS with a portion of your purchases.

This year's Messier Marathon will take place over the weekend of 27-29 March at Bruneau Dunes State Park. For those who have never participated in this annual event, it is a lot of fun and I encourage you to head to the park for a great weekend! If you wish to reserve a campsite, you need to contact Idaho Parks & Recreation directly (1-208-630-5050).

Upcoming BAS events for 2009 include the 100 Hours of Astronomy event from 02-05 April (part of IYA2009), which will take place at DCI; the Bogus Basin star party on June 27th; the Idaho Star Party over the weekend of 21-23 August at Bruneau Dunes State Park and an as-yet unscheduled public star party in the Treasure Valley in late September or early October (perhaps in cooperation with Boise State University's Department of Physics).

If you reserved your campsite in loop "A" at Eagle Cove for the Idaho Star Party at last month's meeting, we ask that you bring your payment of \$53.00 to the planetarium. If you desire to extend your campsite reservation beyond the dates of the event, it is an additional \$21.20/night (\$20 fee plus \$1.20 in sales tax). We will make the arrangements with the parks department for extending those sites. If you prefer to reserve a site in the "B" loop at Eagle Cove or over at the Broken Wheel campground, you again need to contact Idaho Parks and Recreation directly, as we do not reserve any of these sites.

## Star Dates

### Club Events

#### *March*

**BAS Board Meeting:**

Tuesday, March 3<sup>rd</sup>, 7:00 PM  
Discovery Center of Idaho, Classroom #2

**BAS Meeting:**

“Equinoxes and Solstices”  
Friday, March 13<sup>th</sup>, 7:00 PM  
Planetarium at College of Idaho in Caldwell

**BAS Star Party:**

Saturday, March 21<sup>st</sup>  
Dedication Point

**BAS Messier Marathon:**

Friday - Sunday, March 27<sup>th</sup> – 29<sup>th</sup>  
Bruneau Dunes State Park, Idaho

#### *April*

**IYA 100 Hours of Astronomy:**

Thursday - Sunday, April 2<sup>nd</sup> – 5<sup>th</sup>  
Discovery Center of Idaho

**BAS Board Meeting:**

Tuesday, April 7<sup>th</sup>, 7:00 PM  
Discovery Center of Idaho, Classroom #2

**BAS Meeting:**

Friday, April 10<sup>th</sup>, 7:00 PM  
Discovery Center of Idaho, Classroom #2





**BAS Star Party:**

Saturday, April 18<sup>th</sup>  
Dedication Point

**BAS Star Party:**

Saturday, April 25<sup>th</sup>  
Dedication Point

### March Lunar Phases

	New 26 <sup>th</sup> @ 10:06 AM MDT
	1 <sup>st</sup> Quarter 4 <sup>th</sup> @ 12:46 AM MST
	Full 10 <sup>th</sup> @ 8:38 PM MDT
	Last Quarter 18 <sup>th</sup> @ 11:47 AM MDT

### Astronomical Twilight

(Times from the 1<sup>st</sup> to the 7<sup>th</sup> are MST and MDT thereafter)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<b>1</b> 5:46 AM 8:09 PM	<b>2</b> 5:44 AM 8:11 PM	<b>3</b> 5:42 AM 8:12 PM	<b>4</b> 5:41 AM 8:13 PM	<b>5</b> 5:39 AM 8:14 PM	<b>6</b> 5:37 AM 8:16 PM	<b>7</b> 5:36 AM 8:17 PM
<b>8</b> 6:34 AM 9:18 PM	<b>9</b> 6:32 AM 9:20 PM	<b>10</b> 6:30 AM 9:21 PM	<b>11</b> 6:28 AM 9:22 PM	<b>12</b> 6:26 AM 9:24 PM	<b>13</b> 6:25 AM 9:25 PM	<b>14</b> 6:23 AM 9:26 PM
<b>15</b> 6:21 AM 9:28 PM	<b>16</b> 6:19 AM 9:29 PM	<b>17</b> 6:17 AM 9:30 PM	<b>18</b> 6:15 AM 9:32 PM	<b>19</b> 6:13 AM 9:33 PM	<b>20</b> 6:11 AM 9:34 PM	<b>21</b> 6:09 AM 9:36 PM
<b>22</b> 6:07 AM 9:37 PM	<b>23</b> 6:05 AM 9:38 PM	<b>24</b> 6:03 AM 9:40 PM	<b>25</b> 6:01 AM 9:41 PM	<b>26</b> 5:59 AM 9:43 PM	<b>27</b> 5:57 AM 9:44 PM	<b>28</b> 5:55 AM 9:46 PM
<b>29</b> 5:53 AM 9:47 PM	<b>30</b> 5:51 AM 9:49 PM	<b>31</b> 5:49 AM 9:50 PM				

Astronomical twilight begins in the morning when the sun comes to within 18° below the geometric horizon and ends in the evening when the sun sets 18° below the horizon. This is the traditional transition to and from the darkest sky conditions at a location; barring light pollution or the moon.



# A March Binocular Stroll

by Steve Bell

For March, we're going to catch Orion before it disappears for the year. Orion has a wealth of deep sky objects, but this stroll in Orion will be limited to larger objects visible in binoculars. We'll look at the familiar, the unfamiliar within the familiar and a couple of nearby objects.

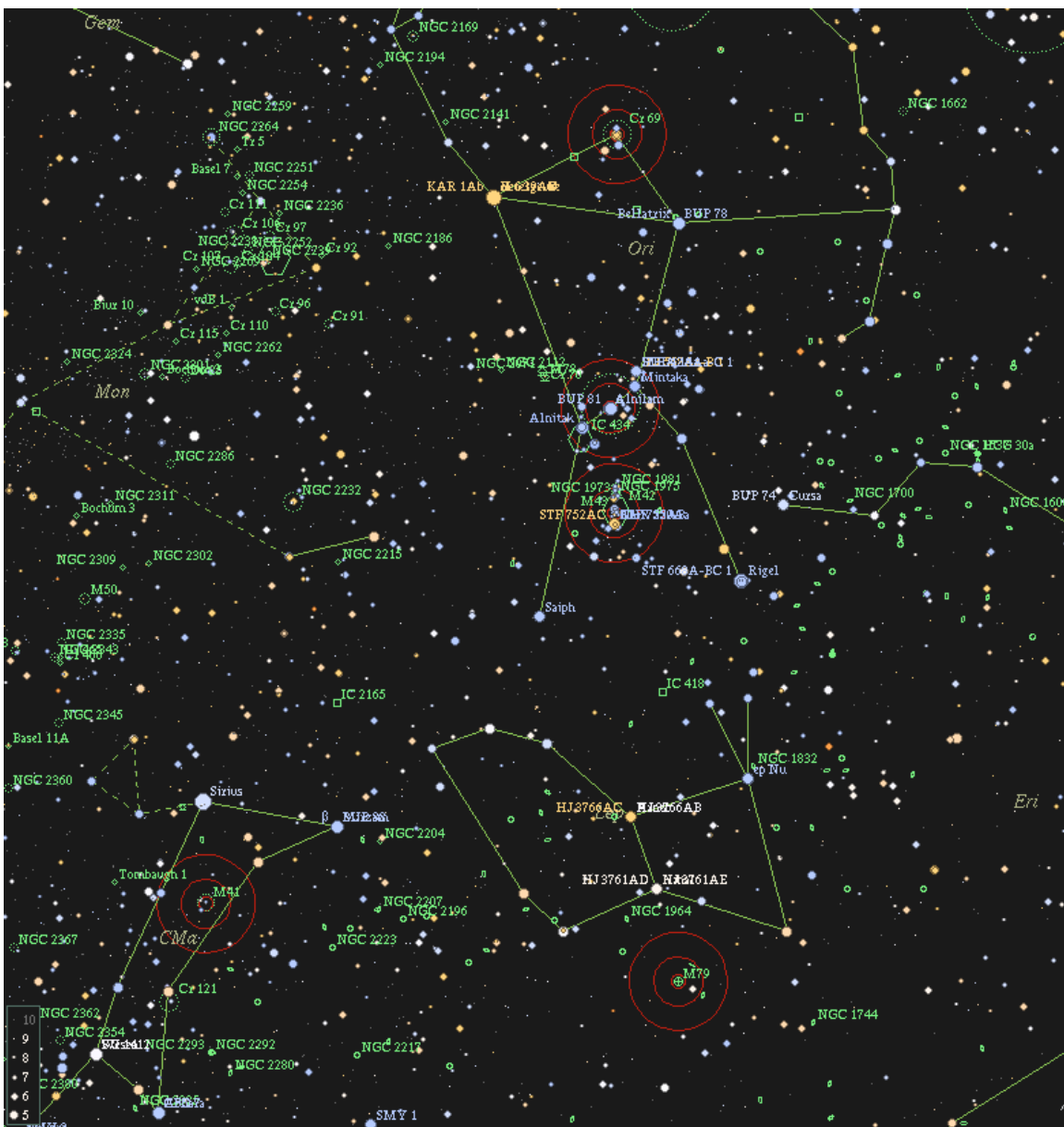


Chart Generated with XEphem

We'll start at lambda Orionis, the peak star in the body-figure of Orion and **CR 69** (Collinder 69). Lambda is a nice multiple star in its own right (quadruple, but you may see only two with binoculars). Our target, however, is CR 69. CR 69 is a loose, sparse cluster containing a total of 20 stars including lambda with six brighter stars. It is about a degree in diameter, with reported nebulosity. I've seen a hint of the nebulosity with a 4" refractor, but never with binoculars. CR 69 is about 1400 light years distant.

Our next target is **Orion's Belt** and the large open cluster **CR (Collinder) 70**. CR 70 is about 2.5 degrees in diameter and encompasses the whole region between the two outer belt stars (Alnitak and Mintaka). The belt stars are members. Membership is on the order of 100 stars and most are brighter than 10<sup>th</sup> magnitude. You need binoculars to see this as a cluster, as the narrow field of view in a scope just won't show it. There are many small asterisms in the cluster, but the one I find most striking is an irregular ellipse with the central belt star (Alnilam) at one focus and a yellow-orange star (SAO 132234, mag 5.9, K5 spectrum) at the other. This is a really pretty region in binoculars and well worth spending some time with. CR 70 is roughly 1275 light years distant.

We now move on to **Orion's Sword** and the plethora of deep sky goodies contained within it. Before moving to individual objects within the sword, take time to take in the whole region. Most binoculars will take in the sword with no problem. The region of the sword is actually filled with clusters and nebulosity and is termed the *Orion Molecular Cloud*. It is a region of star formation roughly centered on M42, where IR observations have shown new stars embedded in dust clouds and surrounded by proto-planetary disks. Surrounding the sword and roughly centered on M42 is *Barnard's Loop*, thought to be the expanding gas shell from a supernova about two million years ago (probably won't be seen with binoculars; brightest arc portion is east of the sword).

Moving to the top of the sword, the first deep sky object is **NGC 1981**, known as the *Crown Cluster*. I guess Orion has his crown hanging on his sword hilt. 1981 is an irregular cluster, sparse, with 10 -12 stars in binoculars, against a background haze of stars/nebulosity if the sky is dark and transparent. Look for the crown shape or a Greek letter pi. The overall cluster is about 25 arcmin in diameter and about 1300 light years distant.

Moving toward M42, you will see two bright stars between 1981 and M42. These are the locators for **NGC 1973-75-77**, the *Running Man Nebula*. While you won't see this nebula in binoculars; it is worth a return trip when you're under dark, transparent skies with a telescope. I had a very nice view of this nebula with an 8" SCT at 83 and 107X under really good skies. Also, try with a narrow-band ('UHC') filter and a wide-field eyepiece.

OK, we've been resisting the impulse until now. Go ahead and look at **M42/M43**. Look for the wings. How many stars can you see in the *Trapezium*? Under decent skies a pair of binoculars can show a lot of detail in the Orion Nebula. Spend some time looking around. Think of the stars forming in the dust clouds, the dark areas or rifts in the nebula. Visible light can't penetrate the dust, but the stars have been observed in the IR. Like most objects in the sword, M42 is about 1300 light years distant.

Our last object in the sword is somewhat anticlimactic. At the bottom of the sword is **NGC 1980**, a cluster and associated nebulosity. You will only see a couple of brighter stars here and, depending on skies and binocular aperture, maybe a few fainter ones. I have never noted any nebulosity in this region in my observing log.

## Orion's Sword

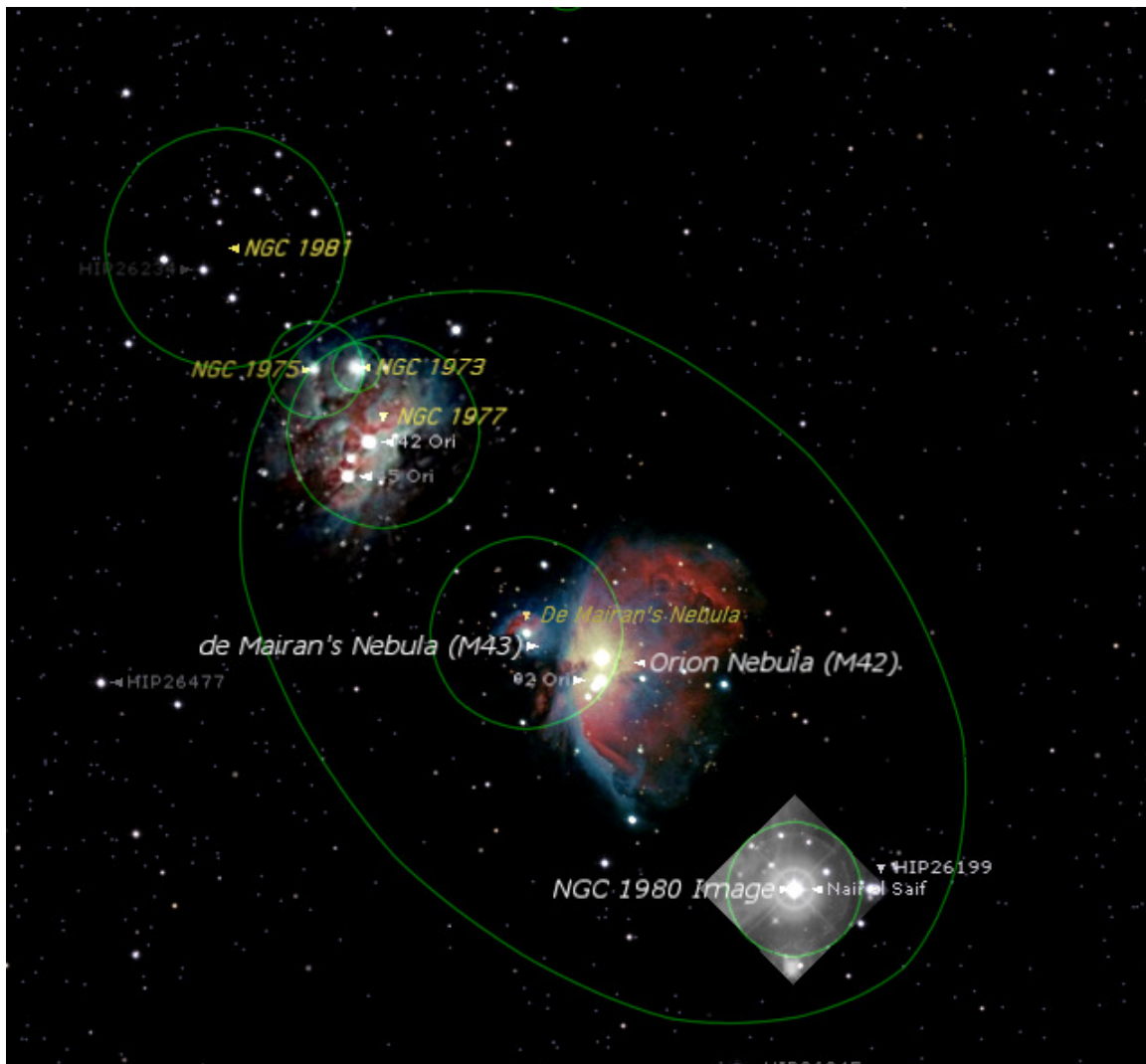


Chart generated with Starry Night Pro 6

Next, we'll drop down south of Orion into the constellation of *Lepus, The Hare*, and locate the globular cluster **M 79**. This is a challenge object for binoculars from a suburban location, so log it for your Binocular Messier list. I managed to find it from the back yard in 15 X 70 binoculars and was able to hold it with direct vision once found. M79 was a small, relatively dim grey disk. You will have to look carefully or you'll scan right over it. Its integrated magnitude is only 8.6 and its diameter is only 8.7 arcmin, but you can find it. M79 is 41,000 light years from the sun and 60,000 light years from the galactic center. There is some discussion and controversy as to whether M79 is actually a Milky Way globular or is gravitationally bound to the *Canis Major Dwarf Galaxy*, which is currently undergoing a close encounter with the Milky Way and will likely be disrupted.

We will wrap up the March trip by shifting eastward from Lepus into Canis Major and look at **Messier 41**. This is a fine binocular cluster, even in suburban sky conditions. From the back yard in 15 X 70's, I saw about 20 stars against a background haze. Overall, it was about 1/6 field of view. You'll get a better view from darker

skies. M41 is about 2300 light years distant with an actual diameter of roughly 25 light years and contains on the order of 100 stars. There are some red giants (K3 spectrum) at the center that should be visible with a scope; I didn't note them with the binoculars in my back yard.

As usual, there is a PDF finder chart in the Files section on BAS1.



## Where did all these gadgets come from?!

by Dr. Tony Phillips

Ion propulsion. Artificial intelligence. Hyper-spectral imagers. It sounds like science fiction, but all these technologies are now flying around the solar system on real-life NASA missions.

How did they get there? Answer: the New Millennium Program (NMP). NMP is a special NASA program that flight tests wild and far-out technologies. And if they pass the test, they can be used on real space missions.

The list of probes that have benefited from technologies incubated by NMP reads like the Who's Who of cutting-edge space exploration: Spirit and Opportunity (the phenomenally successful rovers exploring Mars), the Spitzer Space Telescope, the New Horizons mission to Pluto, the Dawn asteroid-exploration mission, the comet-smashing probe Deep Impact, and others. Some missions were merely enhanced by NMP technologies; others would have been impossible without them.

“In order to assess the impact of NMP technologies, NASA has developed a scorecard to keep track of all the places our technologies are being used,” says New Millennium Program manager Christopher Stevens of the Jet Propulsion Laboratory.

For example, ion propulsion technology flight-tested on the NMP mission Deep Space 1, launched in October 1998, is now flying aboard the Dawn mission. Dawn will be the first probe to orbit an asteroid (Vesta) and then travel to and orbit a dwarf planet (Ceres). The highly efficient ion engine is vital to the success of the 3 billion mile, 8 year journey. The mission could not have been flown using conventional chemical propulsion; launching the enormous amount of fuel required would have broken the project's budget. “Ion propulsion was the only practical way,” says Stevens.

In total, 10 technologies tested by Deep Space 1 have been adopted by more than 20 robotic probes. One, the Small Deep Space Transponder, has become the standard system for Earth communications for all deep-space missions.

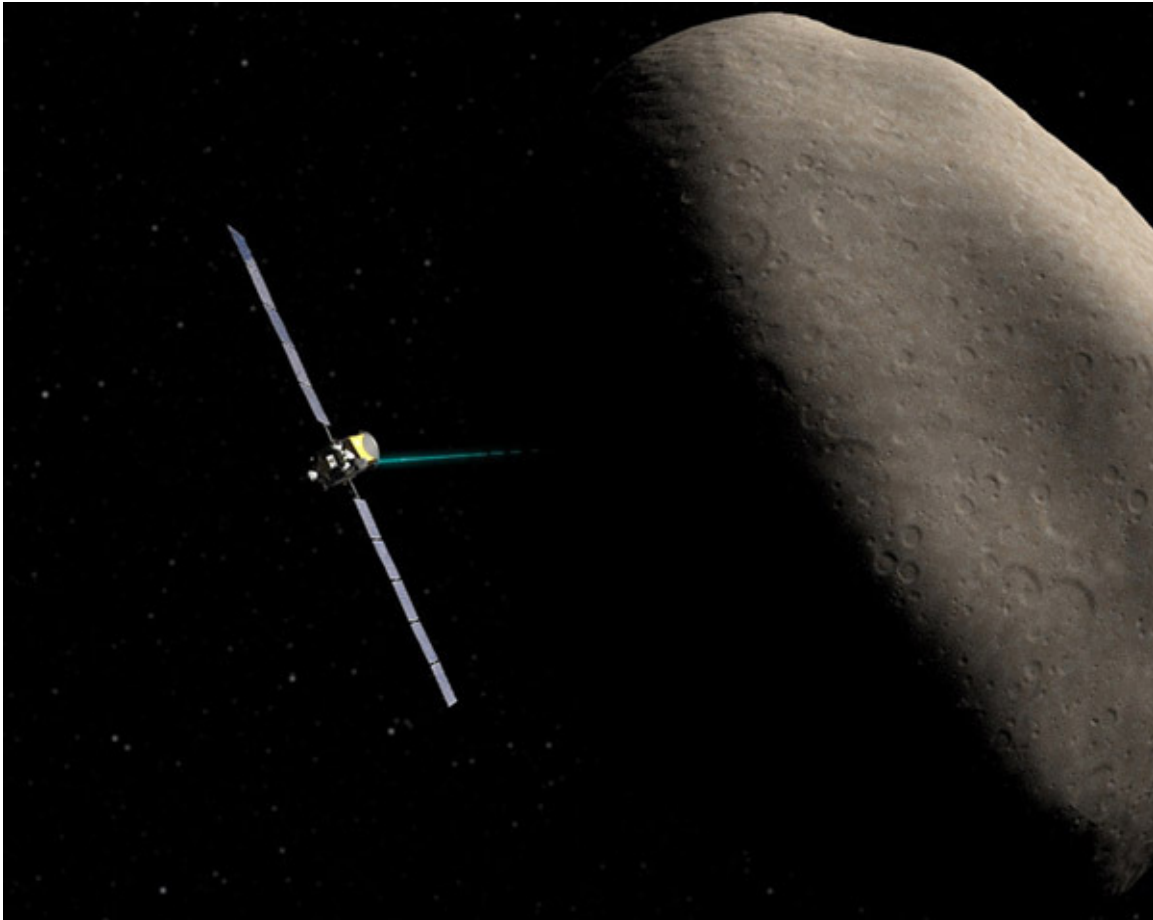
And Deep Space 1 is just one of NMP's missions. About a half-dozen others have flown or will fly, and their advanced technologies are only beginning to be adopted. That's because it takes years to design probes that use these technologies, but Stevens says experience shows that “if you validate experimental technologies in space, and reduce the risk of using them, missions will pick them up.”

Stevens knew many of these technologies when they were just a glimmer in an engineer's eye. Now they're “all grown up” and flying around the solar system. It's enough to make a program manager proud!

The results of all NMP's technology validations are online and the list is impressive:

[nmp.nasa.gov/TECHNOLOGY/scorecard/scorecard\\_results.cfm](http://nmp.nasa.gov/TECHNOLOGY/scorecard/scorecard_results.cfm). For kids, the rhyming storybook, "Professor Starr's Dream Trip: Or, How a Little Technology Goes a Long Way" at [spaceplace.nasa.gov/en/kids/nmp/starr](http://spaceplace.nasa.gov/en/kids/nmp/starr) gives a scientist's perspective on the technology that makes possible the Dawn mission.

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



Caption:

*Dawn will be the first spacecraft to establish orbits around two separate target bodies during its mission—thanks to ion propulsion validated by Deep Space 1.*

**Welcome to BAS**

Welcome to the club and hello. We hope you have a good time, enjoy the hobby, and bring good skies with you. We hold indoor meetings each month at the Discovery Center of Idaho. These start at 7:00pm on the second Friday of the month. There will always be a very interesting program, class or presentation at these meetings, as well as good fellowship. There is always something new to learn.

We typically have two star parties each month around New Moon, except on months that have special events going on (see StarDates). The star parties are usually held at Dedication Point which is just off Swan Falls Road, about 16 miles south of Kuna. For directions and dates check the Calendar page of our website at [www.boiseastro.org](http://www.boiseastro.org). These are free and you don't have to bring your own telescope. Everyone with a telescope is more than willing to let you look. This is one of the best ways to see what kinds of telescopes are available if you're thinking of getting one.

Membership has its privileges:

- Discount subscriptions to Astronomy and Sky and Telescope magazines.
- Sky Atlas 2000
- The Sky Version 4 PC Software
- "The Astronomers" series
- and many more books, videos, and instruments
- Dobsonian and Refractor scopes to check out for a month
- John Dobson's "How to Build a Telescope"
- "The Planets" with Patrick Stewart

Wishing you dark skies and clear nights!