Meteorites of the Buzzard Coulee[1] Strewn Field

(Bruce McCurdy's provisional webpage)

Recovery	Specimen Gallery	Analysis	Outreach & Media	Fireball

The fireball associated with the Buzzard Coulee meteorite fall occurred on 2008 November 20 at 5:26.43 MST and was widely observed across the prairies. One week later the first meteorites were recovered where our photo journal begins.

The first meteorites were located by Ellen Milley, a PhD candidate at the University of Calgary, in a frozen fish pond near the agricultural community of Lone Rock, Saskatchewan. (Photograph: Bruce McCurdy, Edmonton Space & Science Foundation (ESSF) / Royal Astronomical Society of Canada (RASC))

A close-up of the "fish pond meteorite" which thrusts through the ice like a small island. Note the interesting melt/freeze pattern around the meteorite in both of the above images. (Photograph: Frank Florian, Telus World of Science - Edmonton (TWoS-E) / RASC)

Recovery

Dr. Alan Hildebrand, Chair of the Meteorites and Impacts Advisory Committee (MIAC), led the successful search team out of the University of Calgary's Department of Geology. Here Dr. Hildebrand admires the first specimen of the still-to-be-named meteorite fall. (Photograph: Bruce McCurdy, ESSF / RASC)

The interest in the fireball, meteorite search and recovery was unprecedented, achieving front page status on the Edmonton Journal on at least four occasions. The announcement of the recovery drew about 35 media personnel in a 20-vehicle cavalcade from Lloydminster to the site. CHED even sent their traffic helicopter. Here, media crowd around Ellen Milley (unseen) as if she'd just scored the Stanley Cup winning goal. (Photograph: Bruce McCurdy, ESSF / RASC)

The largest meteorite fragment to be recovered in the first days was this 13 kg whopper which creating a form fitting indentation 5-10 cm deep before bouncing out and resting on the frozen ground a few cm away. (Photograph: Bruce McCurdy, ESSF / RASC)

Dr. Alan Hildebrand of University of Calgary and leader of the recovery team chats with Bruce McCurdy of the Edmonton Space & Science Foundation / Royal Astronomical Society of Canada next to the 13 kg meteorite. (Photograph: Franklin Loehde, ESSF / RASC)

Although thousands of meteorites are expected to have rained down over a 20 square km fall ellipse, they were difficult to find in the varied terrain of Buzzard Coulee. Here, Bruce McCurdy of Edmonton Space & Science Foundation / Royal Astronomical Society of Canada displays two meteorites he recovered from a frozen beaver pond, the only specimens the amateur meteor observer recovered in two full days of searching. (Photograph: Frank Florian, TWoS-E / RASC)

Our first meteorite *in situ*. (Photograph: Frank Florian, TWoS-E / RASC)

Our first meteorite and its "crater". (Photograph: Frank Florian, TWoS-E / RASC)

Frank Florian (TWoS-E) holds his first meteorite. (Photograph: Bruce McCurdy, ESSF / RASC)

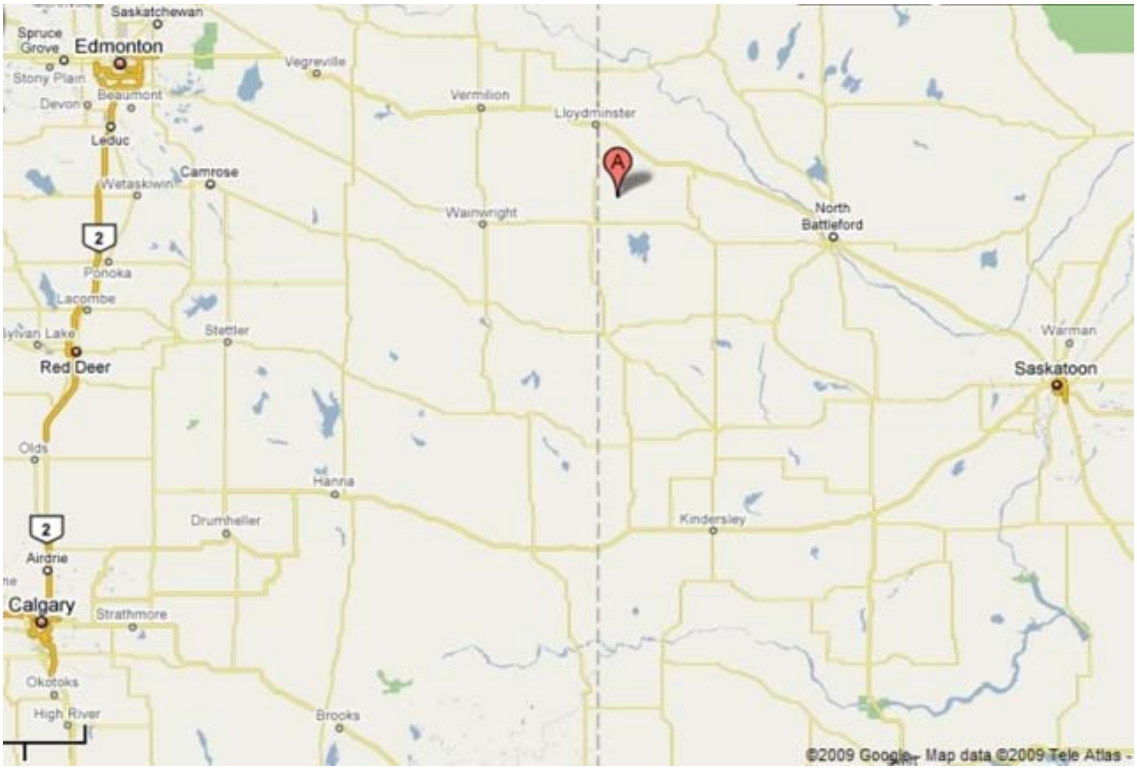
Bruce's first meteorite is next to the hammer. Nearby clods of dirt also resembled meteorites until examined closely. (Photograph: Frank Florian, TWoS-E / RASC)

Bruce McCurdy confirms his first meteorite holds a weak magnetic charge.
(Photograph: Frank Florian, TWoS-E / RASC)

This is the largest fragment we recovered in the beaver pond. All specimens have been turned over to the University of Alberta for detailed analysis. (Photograph: Frank Florian, TWoS-E / RASC)

All four meteorite specimens were recovered within the 25 meters separating Bruce from the photographer. Note the impressive beaver lodge. (Photograph: Frank Florian, TWoS-E / RASC)

Exiting the beaver pond after a successful search. The ground is nowhere near as level as it appears. (Photograph: Frank Florian, TWoS-E / RASC)



The location of the 13 kg fragment. (Franklin Loehde, ESSF / RASC) Click on topographical map for full size.

Specimen Gallery

The 13 kg Marsden Meteorite was displayed the night of its discovery at the nearby Marsden Hotel pub. Frank Florian of Telus World of Science - Edmonton holds the human head-sized space rock between its co-discoverers, the father-and-son research team of Les and Tom Johnson of Drayton Valley, Alberta. The meteorite was returned to the landowner and the research scientists. (Photograph: Bruce McCurdy, ESSF / RASC)

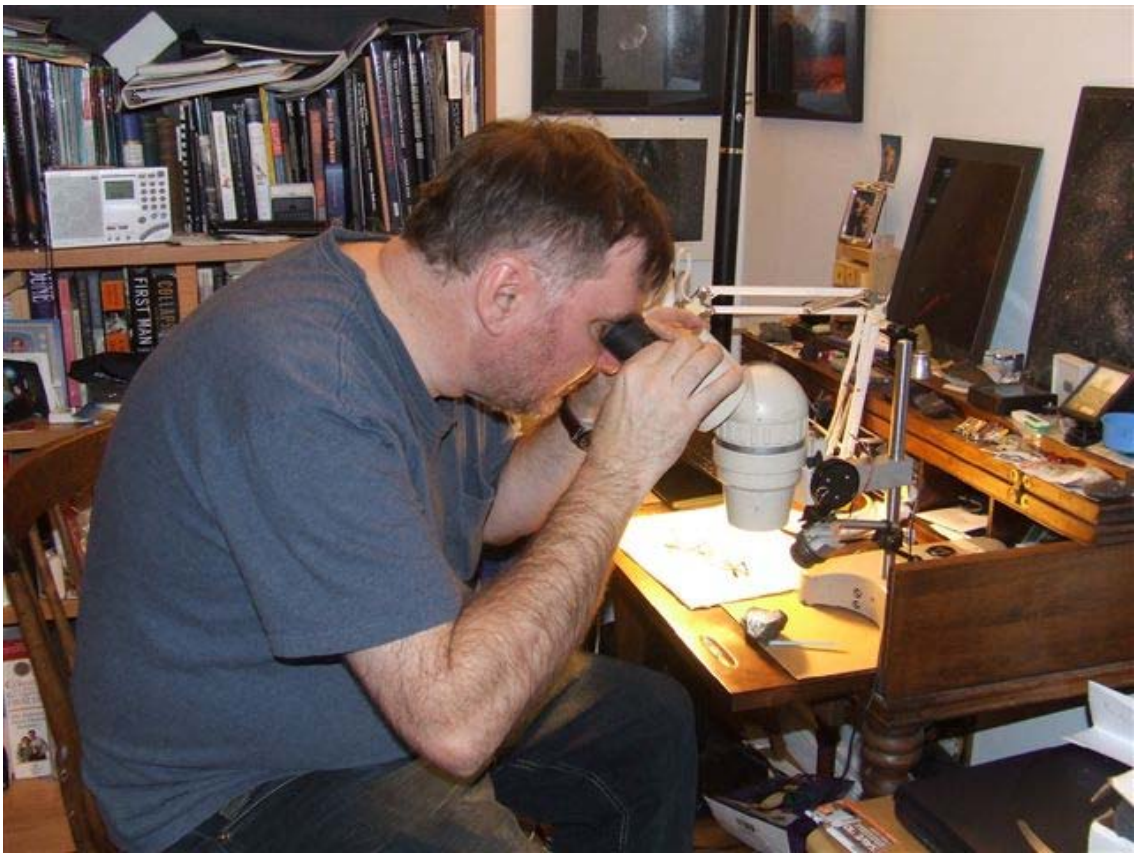
The 13 kg meteorite was roughly the size of a human head, as can be seen in this candid shot taken at the Marsden Hotel pub. (Photograph: Bruce McCurdy, ESSF / RASC)

Various fragments of the Buzzard Coulee meteorite fall. The specimen in the centre is an example of an oriented meteorite -- a fragment which achieved stable orientation rather than tumbling sporadically on its passage through Earth's atmosphere. In such cases, material will ablate in an even manner creating what is known as a shield or nose-cone shape. (Photograph: Murray Paulson, RASC)

Two specimens photographed *in situ* by their discoverer. (Photographs: McCartney Taylor)

A 183g specimen of the Buzzard Coulee meteorite currently in a private collection.
(Photograph: Patrick Herrmann. www.pallasite.ca)

This 7 kg fragment, the second largest (known) specimen recovered to date, was found just off the side of the road. Since this is crown land, it became the property of the lucky finder. (Photograph: Murray Paulson, RASC)



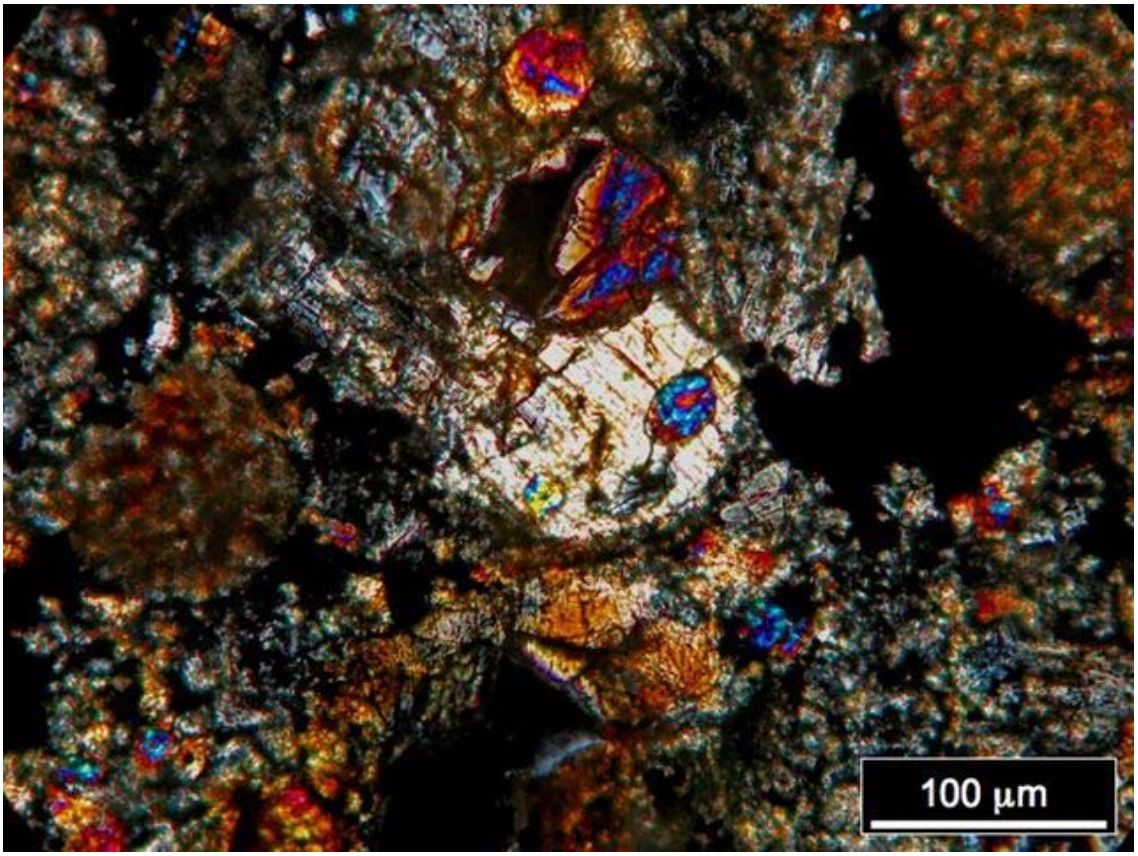
One often gets the opportunity to view astronomical objects through a telescope, but a microscope also reveals plenty of interest and of beauty. Here Bruce McCurdy examines the largest of our recovered specimens. (Photograph: Murray Paulson, RASC)

Analysis

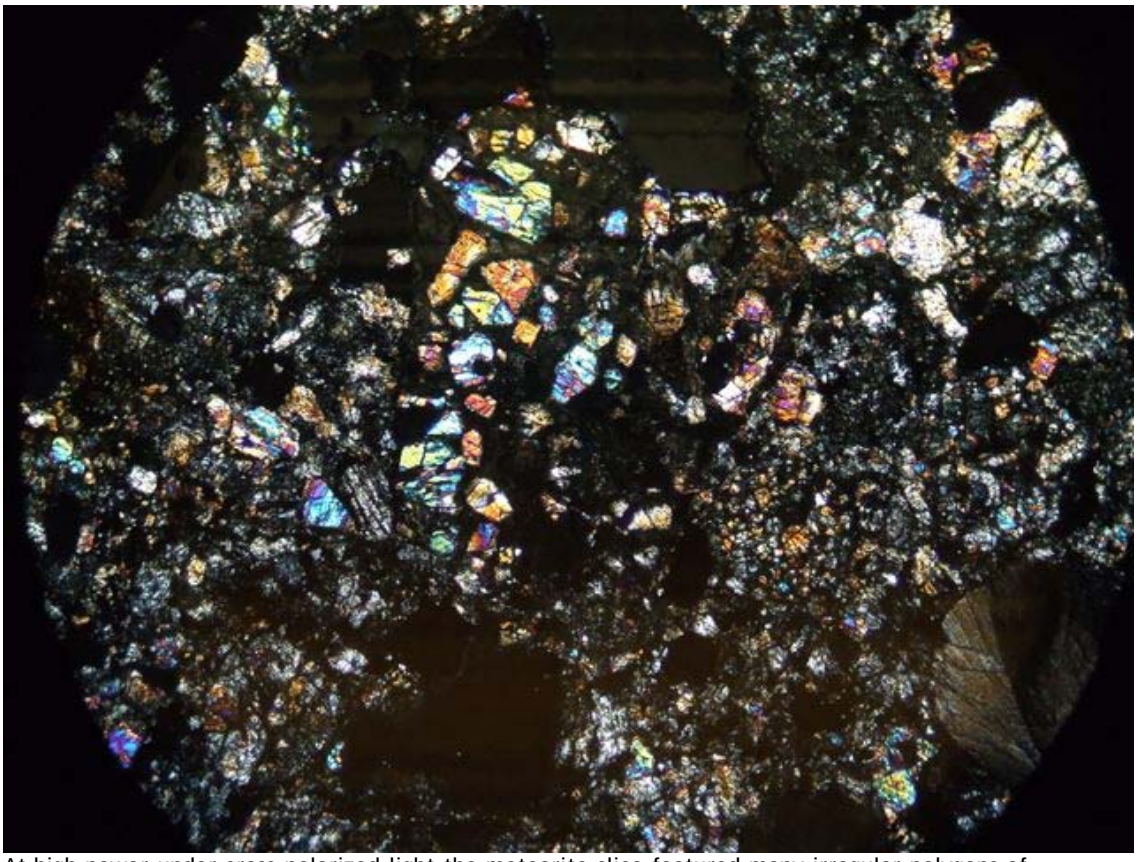
The four specimens recovered by Bruce and Frank were immediately turned over to researchers in the University of Alberta's Earth and Atmospheric Sciences Department. One of the two golf ball-sized meteorites was sliced to prepare a thin section for microscopic analysis. (Photograph: Bruce McCurdy, ESSF / RASC)

Here, Dr. Erin Walton measures a greatly enlarged reproduction of a meteorite slice.

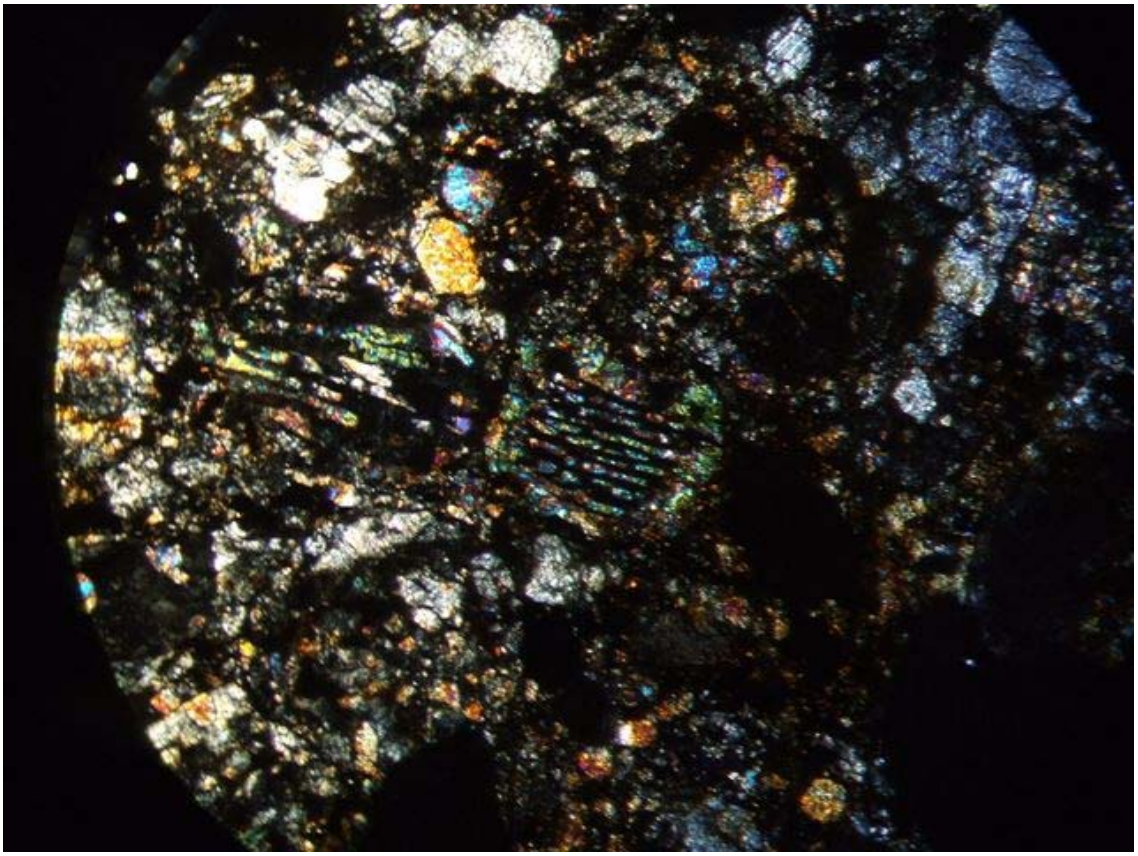
(Photograph: Bruce McCurdy, ESSF / RASC)



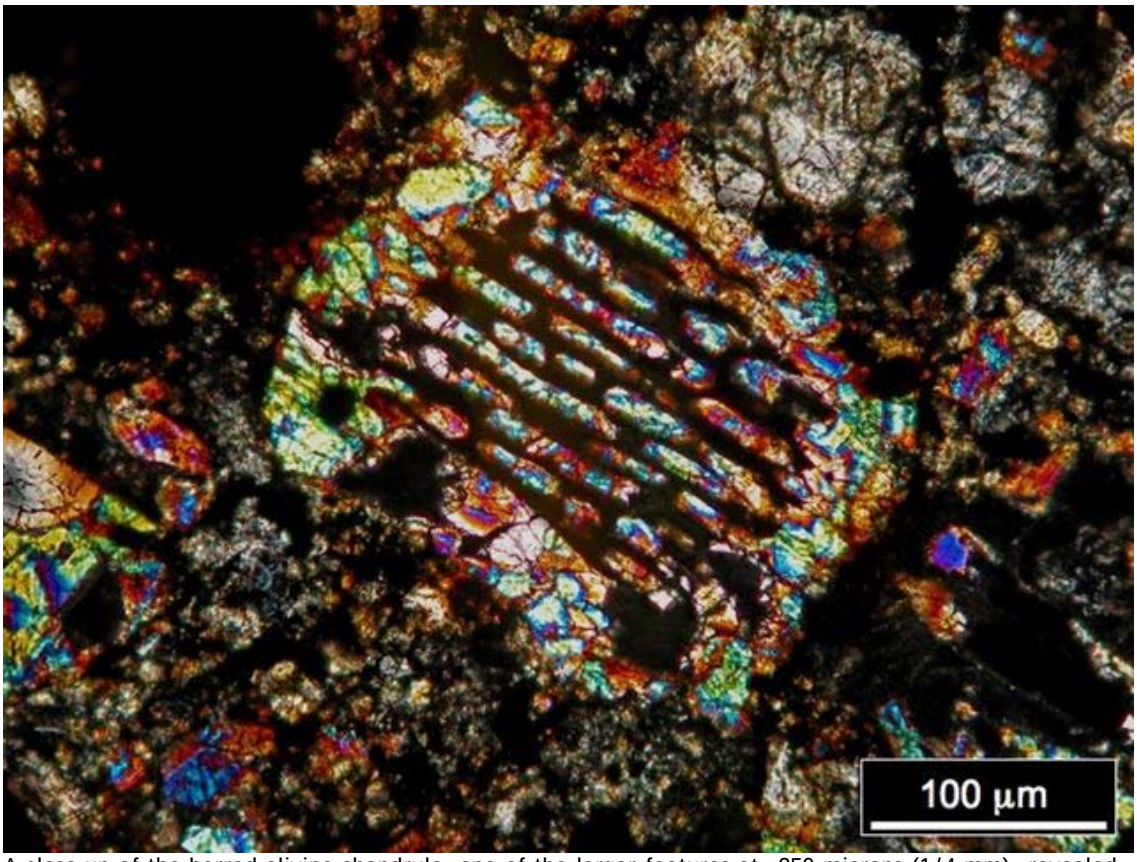
Faculty members cut an extremely thin slice of one of the golfball sized meteorites and shaved it down to 30 microns (.03 mm, or about 1/1000 of an inch) thickness. Cross polarized light shone through the slice revealed remarkable structure. (Photomicrograph: © Department of Earth and Atmospheric Sciences, University of Alberta. Used with permission)



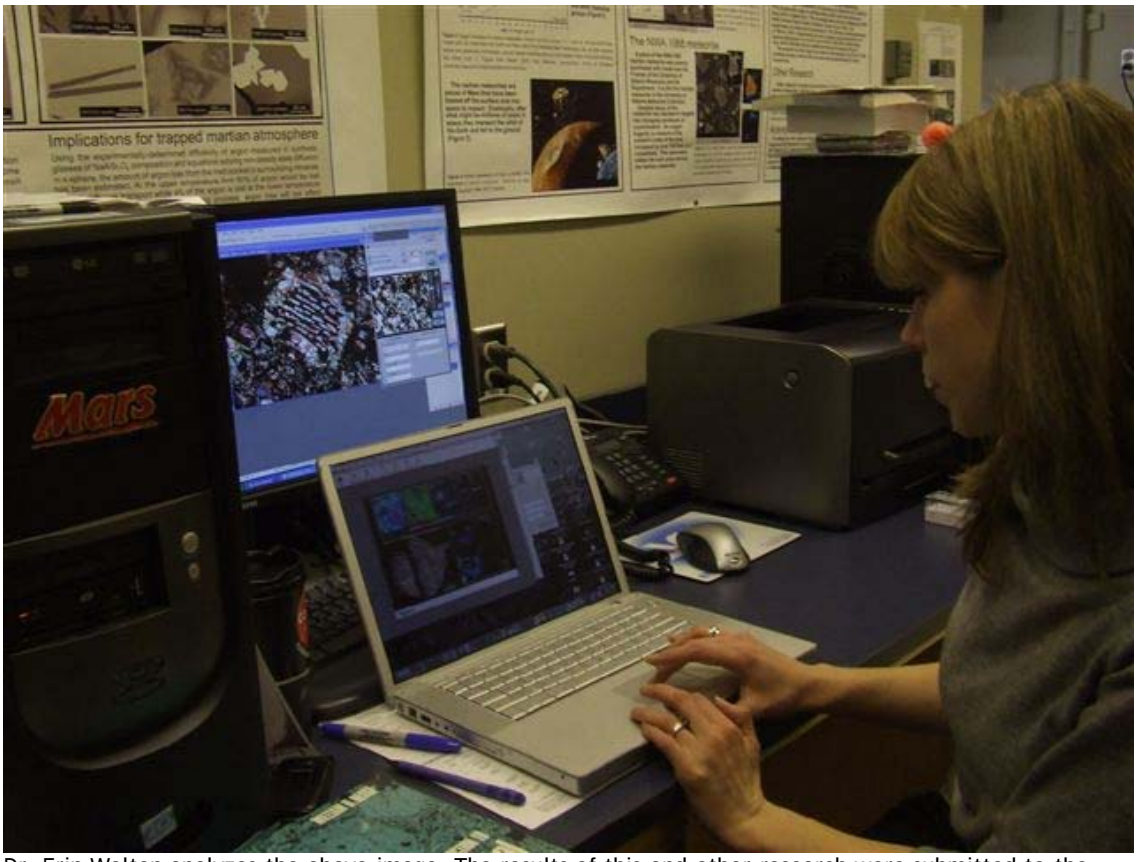
At high power under cross-polarized light the meteorite slice featured many irregular polygons of remarkable colour, yielding an effect similar to stained glass. (Photomicrograph: Bruce McCurdy, taken with permission of Department of Earth and Atmospheric Sciences, University of Alberta.)



The barred structure in the centre is a chondrule of barred olivine. Chondrules are primordial grains from the solar nebula which are thought to be slightly older than the Earth itself. (Photomicrograph: Bruce McCurdy, taken with permission of Department of Earth and Atmospheric Sciences, University of Alberta.)



A close up of the barred olivine chondrule, one of the larger features at ~250 microns (1/4 mm), revealed spectacular structural detail. (Photomicrograph: © Department of Earth and Atmospheric Sciences, University of Alberta. Used with permission)



Dr. Erin Walton analyzes the above image. The results of this and other research were submitted to the 40th Lunar and Planetary Science Conference (2009) in an abstract titled "Mineralogy, petrology and cosmogenic radionuclide chemistry of the Buzzard Coulee H4 Chondrite", Erin Walton et al. (see below) (Photograph: Bruce McCurdy, ESSF / RASC)

This abstract and other abstracts on the Buzzard Coulee meteorite fall at the 40th Lunar and Planetary Science Conference (2009) may be found below:

MINERALOGY, PETROLOGY AND COSMOGENIC RADIONUCLIDE CHEMISTRY OF THE BUZZARD COULEE H4 CHONDRITE. Walton E. L.[1], Herd C. D. K.[1] and Duke M.J.M.[2]
1 Dept. of Earth & Atmospheric Sciences, University of Alberta, Edmonton, AB, T6G 2E3, Canada, ewalton@ualberta.ca. 2 SLOWPOKE Nuclear Reactor Facility, 3126 Dentistry / Pharmacy, University of Alberta, Edmonton, AB, T6G 2N8 Canada.

CHARACTERISTICS OF A BRIGHT FIREBALL AND METEORITE FALL AT BUZZARD COULEE, SASKATCHEWAN, CANADA, NOVEMBER 20, 2008. A. R. Hildebrand[1], E. P. Milley[1] , P. G. Brown[2], P. J. A. McCausland[2], W. Edwards[2], M. Beech[3], A. Ling[4], G. Sarty[5], M. D. Paulson[4], L. A. Maillet[1], S. F. Jones[1] and M. R. Stauffer[5].
1 Department of Geoscience, 2500 University Drive NW, University of Calgary, Calgary, AB T2N 1N4 (ahildebr@ucalgary.ca, epmilley@ucalgary.ca), 2 Department of Physics and Astronomy, The University of Western Ontario, London, ON, N6A 3K7, 3 Department of Physics, Campion College at the University of Regina, Regina, SK S4S 0A2, 4 Edmonton Centre, Royal Astronomical Society of Canada, 5 Departments of Physics and Engineering Physics and Department of Geological Sciences, University of Saskatchewan, Saskatoon, SK S7N 5E2.

A FIRST LOOK AT THE PETROGRAPHY OF THE BUZZARD COULEE (H4) CHONDRITE, A RECENTLY OBSERVED FALL FROM SASKATCHEWAN. M. L. Hutson[1], A. M. Ruzicka[1], E. P. Milley[2], and A. R. Hildebrand[2]
1 Cascadia Meteorite Laboratory, Department of Geology, Portland State University, 17 Cramer Hall, 1721 SW Broadway, Portland OR 97207-0751, USA (mhutson@pdx.edu), 2 Department of Geosciences, University of Calgary, 2500 University Drive NW, Calgary, Alberta, T2N 1N4, Canada (ahildebr@ucalgary.ca).

The largest specimen recovered by Bruce and Frank was some 7 cm along its longest axis, just right to comfortably fit within this 15cm "lead cave" at the University of Alberta's SLOWPOKE nuclear reactor where its cosmogenic radionuclides (isotopes) were counted for seven days. The earlier a fragment's exposure to cosmic radiation is measured, the more accurate the results; in this case the count was started within eleven days of the meteorite fall.

Outreach & Media

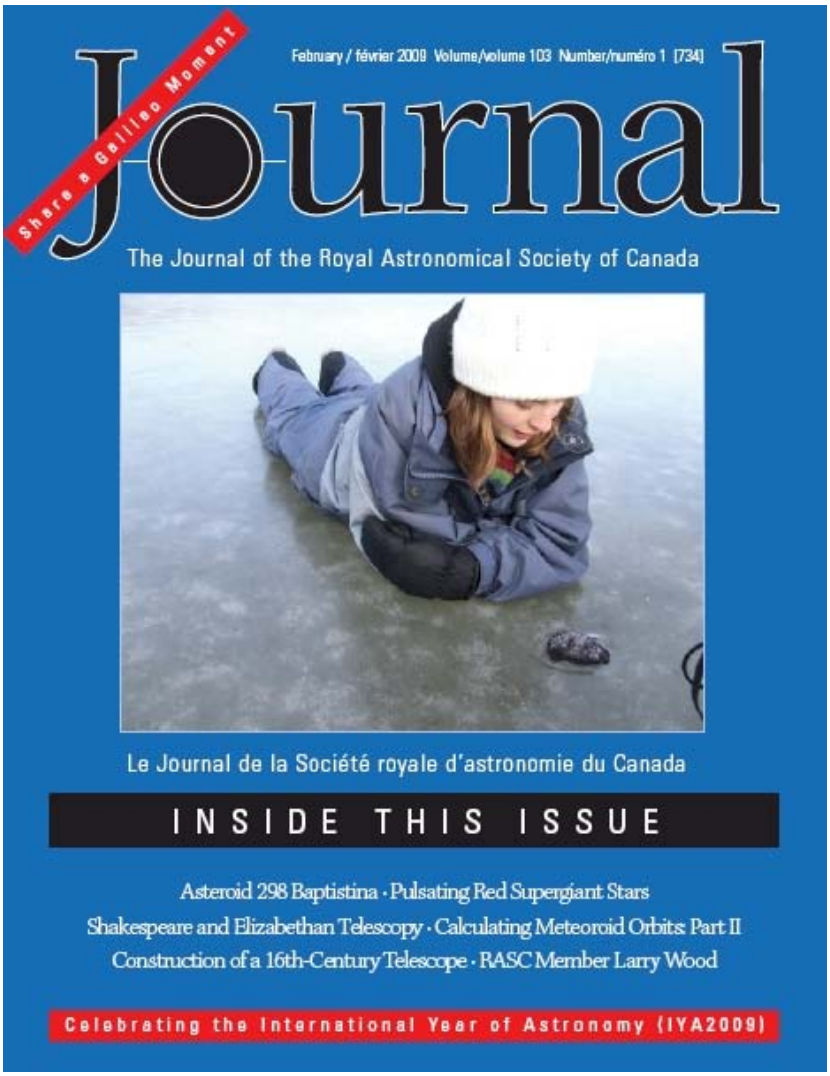
There has been great public interest in the meteorite fall, a small amount of which has been spread by word of mouth. Here Bruce McCurdy gives a presentation entitled "Space Rocks!" to an attentive audience in Yellowknife, Northwest Territories, during his visit there in early January. His presentation and that of fellow RASC member, Stephen Bedingfield, on the total solar eclipse in the Canadian Arctic on 1 August 2008, was the first International Year of Astronomy (IYA) event to be held in Yellowknife. (Photograph: Stephen Bedingfield, RASC)

This specimen from the private collection of Stephen Bedingfield (pictured below, standing at rear) ...

(Photograph: Bruce McCurdy, ESSF / RASC)

... was passed among audience members during Bruce's presentation ...
(Photograph: Lynn Bedingfield)

... where it received close attention.
(Photograph: Stephen Bedingfield, RASC)



Bruce's photo of Ellen Milley and her find is featured on the front cover of the February 2009 edition of the *Journal of the Royal Astronomical Society of Canada*. Bruce, a Contributing Editor of JRASC since 2000, also had the honour of writing the lead editorial on the subject of the Buzzard Coulee meteorites. (Photograph: Bruce McCurdy, ESSF / RASC)

Interest in the meteorite has been international, indeed global in scope. Bruce and Frank's pictures have been published in France's Astronomie magazine and the Slovenian journal Spika. This website has been linked by numerous websites and blogs in many different languages, including Discover Magazine, Astronomy Magazine, The Universe Today, the Society for Popular Astronomy, and even Meteor Crater (AZ) News. At last count this website at Skyriver.ca has had over 20,000 visits from 90 different countries, a most gratifying response. (Photograph: Bruce McCurdy, ESSF / RASC)

Our pictures were also posted in a four-page spread in the Finnish popular astronomy magazine "Tähdet ja avaruus" (Stars and Space). It is the member magazine of the National Astronomical Association Ursa, which compromises 90% of its circulation of 16,500. It was a surreal experience for Bruce to read quotations of himself speaking (presumably!) perfect Finnish. (Photograph: Bruce McCurdy, ESSF / RASC)

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International Year of Astronomy declared to inspire people to gaze upwards

JODIE SINNEMA
Journal Staff Writer
EDMONTON

For 10-year-old Alex McPhee, Edmonton's skies are full of weird wonders far more spectacular than fiction.

Through his telescope, he has seen interstellar clouds of dust and stars that twinkle blue and red.

He has delved into Stephen Hawking's works on black holes and made clay models of Saturn's moons. And this year, he's part of a worldwide group of stargazers hoping to get more people looking skyward to celebrate the 2009 International Year of Astronomy.

This year marks the 400th anniversary of the first use of the astronomical telescope by Galileo Galilei in the early 1600s. His handheld telescope was less powerful than even the cheapest of children's telescopes today, but with it, Galileo discovered the phases of Venus and the moons of Jupiter and opened up a new world that no one had ever seen.

On Saturday, Edmonton kicked off its celebration of the United [illegible] declared Year of Astronomy.

WALTER TYCHNOWICZ, THE JOURNAL
Five-year-old Joel Gilleland checks out the Buzzard Coulee meteorite fragment with a microscope on Saturday.

2003, people looked at the sky and were

sonal telescopes in St. Albert, Sherwood Park and along Edmonton's 100th Avenue promenade overlooking the river valley. Stargazing is also planned for Elk Island Park in February.

But Florian is encouraging people to look at the sky with the naked eye, to learn the constellations and notice the waxing and waning of the moon. He said the average pair of binoculars has more strength than Galileo's original spy glass. And with special filters available at the observatory, people can look for [illegible]pts and solar flares during the day. [illegible]an catch hundreds of falling stars during August's annual Perseids meteor shower. "It kind of gives us a feeling of our place in the universe," Florian said. "It makes all our problems in the universe so small."

He is also using the International Year of Astronomy to promote the idea of making Coronation Park — the area around the Telus World of Science — an urban dark-sky preserve. He would like the lights along 111th Avenue to be replaced with energy-efficient full cut-[illegible]hts that only shine downwards [illegible]treet. The light from regular

Once the 151 g specimen completed its stay in the lead cave, it was returned to the discoverers for display at Telus World of Science - Edmonton. It was a feature attraction at the January 10 kick-off event for the International Year of Astronomy, an event which drew about 1,000 visitors. Here the news of that event is captured -- and propagated -- in a story that appeared in the next day's *Edmonton Journal*. (Photograph: Bruce McCurdy, ESSF / RASC)

Maybe it was the "meteorite shooters" -- Sambuca, Kahlua, and Grand Marnier -- that kept popping up on the house during that unforgettable celebratory evening at the Marsden Hotel pub that might have affected the shutterbug, but this slightly out-of-focus shot of Bruce holding the giant meteorite is an appropriate keepsake of what has been a dizzying experience. At this moment I realized I was simultaneously holding one of the oldest rocks on Earth, and one of the newest. Little did I know that in

the days and weeks after touching and being touched by this undeniably extraterrestrial object, I would wind up making contact in some form or other with intelligent life from all over our own exquisitely fragile globe.
(Photograph: Frank Florian, TWoS-E / RASC)

Videos of the November 20, 2008 Fireball

The fireball associated with the meteorite fall occurred on 2008 November 20 at 5:26.43 MST. It was observed by thousands of people across the prairies, and sparked a range of reactions from delight and wonder to fear and loathing. This video captured by a peace officer's dashboard cam in Devon, AB, provides an excellent electronic eyewitness account of the event. This video, specifically the latter part as the fireball comes down below the streetlights and through the cloud decks, closely matches Bruce McCurdy's visual observation of the fireball through my living room picture window in central Edmonton about 40 km away, with multiple brilliant explosions illuminating previously unseen clouds. (Photo credit: Global Television)

Another video of the fireball recorded by Andy Bartlett of Edmonton. (Photo credit: CBC)

Fireball as Seen in Biggar, Saskatchewan - CBC Online

Notes: 1. This webpage previously made reference to the Lone Rock strewn field (and Lone Rock meteorites, and so forth). This was prior to the Meteoritic Society officially naming the meteorite fall after Buzzard Coulee.

Email Bruce McCurdy with your comments!