

Black Canyon Astronomical Society (BCAS)

Monthly Meeting Minutes
Thursday February 17, 2022

7:00 p.m.

Online BCAS video meeting using ZOOM video conferencing service

Submitted by Sara Ungrodt- co-secretary

Note: **BCAS Business Topics:** Business will not be covered in this video conference.

26 connections and 6 pairs- total 32 people.

**Minutes Summary: Meeting started at 7:05 pm
This is being recorded.**

President Bryan Cashion opened meeting. Shared Agenda.

Program Topics:

Astronomy news:

Nancy, Pres. of WCAC has formed a special dark sky committee for Colorado National Monument. Val S and Aaron Watson assisting. Colorado.

Val- introduced Aaron Watson of Paonia, CO as new Colorado IDA chapter chairperson. Some 2022 budget money (a few hundred dollars?) available for dark sky causes. Submit requests to Val. Val says there will be changes in IDA reporting requirements and guidelines. Likely more “restrictive”. Good to open new cases soon. Aaron says thanks to Val and seeking mini grants. Star charts, etc. can be purchased with mini-grant funds.

Presentation:

Marshal Clark (BCAS member) will speak on “Iron Meteorites - The Microstructure and What it Tells Us”

Program Description:

What can create more wonder than the objects in the night sky? Within the structure and arrangement of phases found within iron meteorites is a snapshot of the formation of our solar system, which also lead to the creation of the earth and all of its spectacular nature. Meteoric iron is unique and represents some of the oldest materials on the earth's surface. This meteoric iron formed within the cores of small planet-like asteroids some 4.5 billion years ago. Owing to the extremely slow cooling rates (a few degrees per 100,000 to 1,000,000 years) and extremely high pressures (on the order of 10,000 atmospheres) within an asteroid, these structures are not naturally found on Earth.

Some of Marshal's images- thin slices

3 slides- common materials in everyday life-graphite brittle, carbon steel

Iron history- wrought, malleable,

George VanderVort Metallographer inspired him

Marshal stacks images

Iron meteorites unique- iron in pure form in Iceland and Russia- rare

Early humans used copper, silver, platinum, Gold- soft

Bronze age- campsite near outcrop ores-tin and copper.

Made tools to pound

Meteoric metal- "Iron", holy metal early humans

Photo of the "Woman"- The Inuits chipped off pieces

Iron cooled slowly in the cores of big asteroids/protoplanets- we can't replicate that on earth.

Meteorites Iron, nickel, alloy, may contain minerals not commonly found on earth.

Marshal explained how he makes his slides.

Different slides from diff meteorites around the world.

Meteor,

Meteorites, meteoroids, definitions

40,000-60,000 tons of extraterrestrial material falls on earth every year.

Only 2 people recorded being hit by meteorites

Meteorites are cool when they hit.

Classification- Fall (witnessed)vs. Find (during collecting)

Meteorites usually come from asteroids left over from the formation of our solar system.

Some are comet debris

Pieces of moon or Mars interstellar dust

VESTA-

Core, mantle, crust

Where do they fall

- **Most fall in ocean**
- **Some gravitational pull towards equators**
- **Most in arid region- can find easier**
- **A lot found in Antarctica- lasts 250,000 years**

When do they fall- more during the day- has to do with orbit and rotation

Why do we care?

Earth is very active- 4.6 billion years old

Stuff meteorites made of is the origin of our universe

They cool so slowly we cannot reproduce that on earth.

Talked about primary classification of meteorites-Chondrites and non-chondrites

Iron meteorites

Sulphur carbon and many other minerals

Lots of difficult-to-pronounce minerals observed in iron meteorites: kamacite (90% Fe,

10% Ni), taenite (Fe with 20% to 65% Ni), and troilite (FeS) are most common

Crystal sizes in meteorites are extremely large (many meters wide!), due to their extremely slow cooling rates

Metals are crystalline solids

91 of the 118 elements are metals

Beautiful slides...photomicrographs

Various techniques to process slides- etched and polished

Historical Meteorites

Willamette Oregon

Natives considered it sacred

Tunguska explosion, Barringer crater, Hoba, Chelyabinsk

Chicxulub 65 mill yrs ago- Yucatan peninsula

Cape York Greenland discovery via Inuits

Perry sold meteorites to NY Museum, traded rifles

Meteorite fell 13,000 yrs ago

Showed references.

Marshal's talk ended 8:15 p.m.

Questions for Marshal:

Bryan- where does he get the samples- buy from reputable sources

10 grams .5 inch by .5 inch

\$ 1-\$10 /gram

Intact meteorite most valuable

Art: Any twinning, cleavage? only in Kamacite

Sara-Does he have a travelling art exhibit- some at Mother Earth.

Bryan will include a link to Marshal's website with link to BCAS meeting recording.

Marshal requested that some of his images might be included in our BCAS calendars. Art and Joyce make a personal calendar.

Bryan- wrap up. Next meeting March 17th on line- Bryan and Sara at Centennial room
think about transitioning to hybrid meetings.

Bryan is speaker March 17- no topic yet.
8:29 pm meeting ended.