

# FAULTED DIGEST

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December

# 2024

AIPG Colorado  
Selection Publication

Brought to you by AIPG Colorado

## Welcoming Fall in Colorado

*Image Credit: Jack Braurer*



COMPETENCE · INTEGRITY · ETHICS

# THE PRESIDENT'S

Joe Brinton



Hello!

Fall is in the air. It is a vivid reminder of why it is so great to live in Colorado.

A few months ago, we were privileged to host the AIPG National Convention, right here in Colorado. It was a raging success. AIPG members from all over the U.S. (and a few attendees from overseas) got to witness Colorado at its best. There were many interesting technical talks, some socializing events, and awards presentations. But the highlights (in my humble opinion) were the various field trips taken throughout the San Juan Mountains. I am sure that the mountains of Colorado now hold a special place for the many who had the chance to come.

Once again, I want to thank all those that worked so hard to organize, coordinate, and execute such a great meeting.

As we prepare for the winter season, please take an extra moment to consider extra safety precautions, related to the weather, in the work that you do. Be safe, and do good work.

Joe Brinton

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# NEWSLETTER EDITOR'S

Vanessa  
Magaña



Happy Fall!

I hope everyone is having a fantastic autumn! We at the AIPG thank you for your support and as always, we welcome all of you to submit any articles, research papers, media, photos, new findings, etc., that you wish to have published in our quarterly newsletter. Please be sure to submit high quality content and of course you can email me directly if you have any questions.

A special thank you to our current sponsors *Davey* and *Vista GeoScience*, for their continued support. You can advertise your business too while supporting the AIPG! Head to [https://aipg-cosection.org/form.php?form\\_id=21](https://aipg-cosection.org/form.php?form_id=21) for information on sponsorships and pricing.

Are you looking for a new job? Check out our job postings page for current job opportunities in Colorado and out-of-state.

Enjoy the changing colors and chilly breeze because it is sweater weather! Take care and I hope you all have a Happy Holidays!

Vanessa Magaña

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*Image Credit: Bing Stock Images*

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2024

# STUDENT

2 4.0026

He

Helium



This student spotlight is...

*Dalton Seymour!*

He performed his undergraduate research in Chemical and Textural Degradation of the Kaibab Limestone's Helium Diffusion Resistance. He worked with the USGS and performed research at the USGS Micro Beam Laboratory. Dalton is a student at MSU Denver, and this Fall is his last semester.

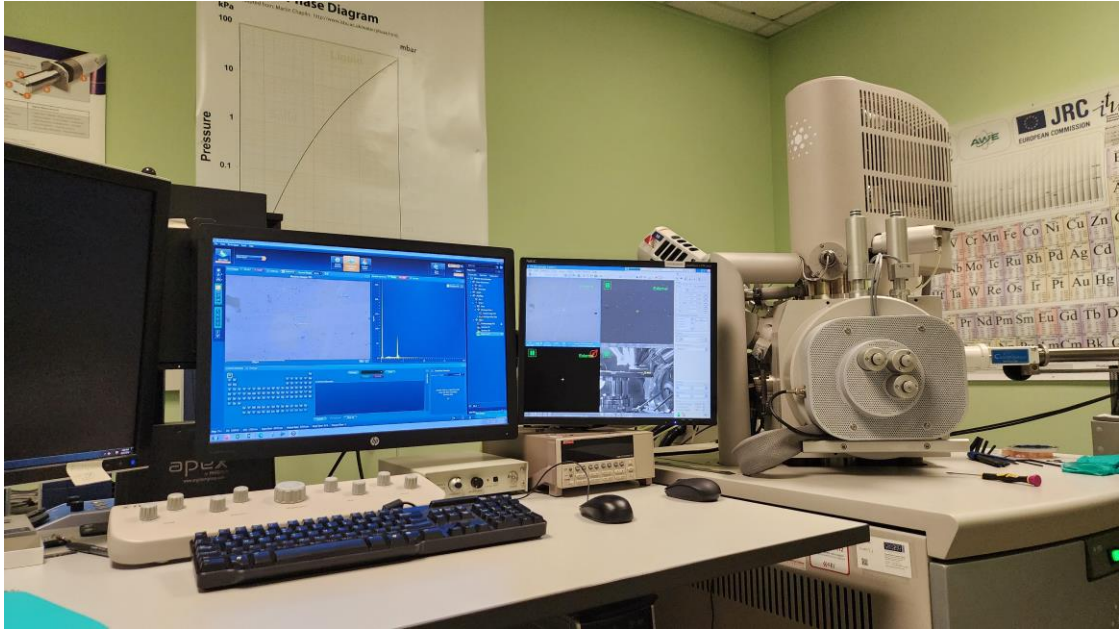
**Excellent and fascinating work Dalton!**

Image Credits: Background, Bing Stock Images.

# STUDENT

## Continued...

*USGS Micro Beam Laboratory, Image Provided by Dalton Seymour*



*Image Credits: Kaibab Limestone, Grand Canyon South View, flickr.com*



SPOTTLIGHT

# Crocoite

Crocoite is usually found as “long prismatic crystals and more rarely as equant crystals” (mindat.org). The crystals are poorly terminated and are bright red to orange red in color. These crystals are translucent and have an adamantine to vitreous luster. Crocoite has a vibrant orange yellow to mustard-yellow streak. In 1763, Mikhail Vassil’evich Lomonosov recognized crocoite as a red lead ore.

*Formula:*  $\text{PbCr}^{6+}\text{O}_4$

*Luster:* Sub-Adamantine, Sub-Vitreous, Resinous, Waxy

*Transparency:* Transparent, Translucent

*Color:* Orange, red, yellow; orange-red in transmitted light.

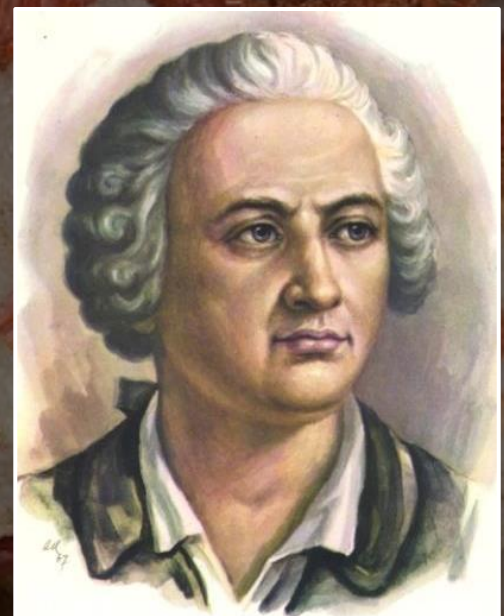
*Streak:* Yellow-orange

*Mohl's Hardness Scale:* 2.5 – 3.0

*Cleavage:* Poor/Indistinct

*Crystal System:* Monoclinic

*Specific Gravity:* 5.97 - 6.02



# Torbernite

Torbernite is a vibrant green mineral named after Torbern Olof Bergmann, a Professor of Chemistry and Physics, University of Uppsala in Sweden. Bergmann was one of the most important chemists and mineralogists of the 18<sup>th</sup> century. Torbernite is a copper phosphate mineral and is slightly radioactive.

*Formula:*  $\text{Cu}(\text{UO}_2)_2(\text{PO}_4)_2 \cdot 12\text{H}_2\text{O}$

*Luster:* Sub-Adamantine, Vitreous, Waxy, Pearly

*Transparency:* Transparent, Translucent

*Color:* Emerald-green, dark green, apple-green.

*Streak:* Pale green

*Mohl's Hardness Scale:* 2.0 – 2.5

*Clearance:* Perfect

*Crystal System:* Tetragonal

*Specific Gravity:* 3.22



# LAND FEATURE-ING

## Mesas

### What is a Mesa?

A mesa is a geographical feature characterized by an elevated section of land with a flat top, whose sides form cliffs or gentle slopes. The name comes from the Spanish word “mesa” which means table.

### How Do They Form?

Mesas form from the horizontal stratification of rock layers that are then pushed upwards from tectonic forces. Overtime, the softer rock layers are weathered away leaving behind the more resistant rock layers which made up the body of the mesa. This process can take millions of years.

### What Types of Rocks Make Up a Mesa?

The most common rocks that make up a mesa are conglomerate, chert, sandstone, basalt and lithified rock from lava flows. These rocks are very resistant to weathering and erosion.

### Grand Mesa, GMNP Colorado

The Grand Mesa is the largest mesa in the world sitting at above 11,000 ft (3,352.8 m) above sea level. It formed about 10 million years ago from an ancient lava flow during the Miocene Epoch. The lava flow came from a series of eruptions from the Crag Crest region. The top of the mesa is main comprised of hard volcanic basalt, Underneath the basalt are layers of Eocene-aged shales, and beneath that is the Mesa Verde group. The bottom layers are the Mancos Shale.

### References:

Chepkemoui, J. (2017, October 21). *What Is a Mesa?* WorldAtlas. <https://www.worldatlas.com/articles/what-is-a-mesa.html>

# NATIONAL EVENTS

For more info on all NATIONAL EVENTS, please visit: [https://aipg.org/events/event\\_list.asp](https://aipg.org/events/event_list.asp)

## O C T

13<sup>th</sup> – 19<sup>th</sup>: Earth Science Week

14<sup>th</sup>: Views from Above and Below: Supporting Sustainability with Earth Observations 1:00pm Eastern Time Zone

16<sup>th</sup> – 18<sup>th</sup>: MRMR 2024 Conference

26<sup>th</sup>: AIPG Wisconsin and Indiana/Illinois Sections Joint Field Trip

29<sup>th</sup>: AIPG Lunch & Earn - 1963 Vaiont Dam Disaster 11:00am Mountain Standard Time

## N O V

2<sup>nd</sup>: AIPG National Executive Committee 4th Quarter Hybrid Meeting 9:00am Mountain Time

5<sup>th</sup>: AIPG Minnesota Section Meeting - Floods, Droughts and Money: A Water Engineer Thinks Through Climate 11:45am Central Standard Time

19<sup>th</sup>: AIPG Texas Section Webinar Series-The GeoPolitics of Energy: Part 2 Noon Central Standard Time

20<sup>th</sup> – 22<sup>nd</sup>: 5th IPGC

## D E C

4<sup>th</sup>: AIPG Town Hall for Section Officers 3:00pm



# COLORADO EVENTS

For more info on all COLORADO EVENTS, please visit: [https://aipg.org/events/event\\_list.asp](https://aipg.org/events/event_list.asp)

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## D E C

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# FUTURE CAREERS

Ledios [Economic Geologist](#)

Albany, Oregon, United States (on-site) Full-time

USA Jobs [Hydrologist \(Groundwater Modeling\)](#)

Carson City, Nevada, United States (on-site) Full-Time

UR Energy [Production Geologist](#)

Lost Creek, Wyoming, United States (on-site) Full-time

TRC Companies, Inc.

[Project Manager, Environmental Remediation & Construction](#)

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Learn More!



# CLAYS

C V V L Q Y A K K A Y O Z X F Z L O N C  
J Z I C Z J H W U A D D K G F Z H J I H  
Z T P R H E T Q U U O E W T D L Y J D O  
A Q H H J T U Y F J K L E K A I H Z Z R  
Q N Y Q B I O R E N M G I Q Y W E E X I  
U R L U E L B N S L R M C N D G F T X T  
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U R C F F V M O E J S O P I U T D B A Q  
C G A M M J I O S Z G Q E S N C N I B Q  
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1. Vermiculite

2. Phyllosilicates

3. Bentonite

4. Kaolinite Talc

4. Chorite

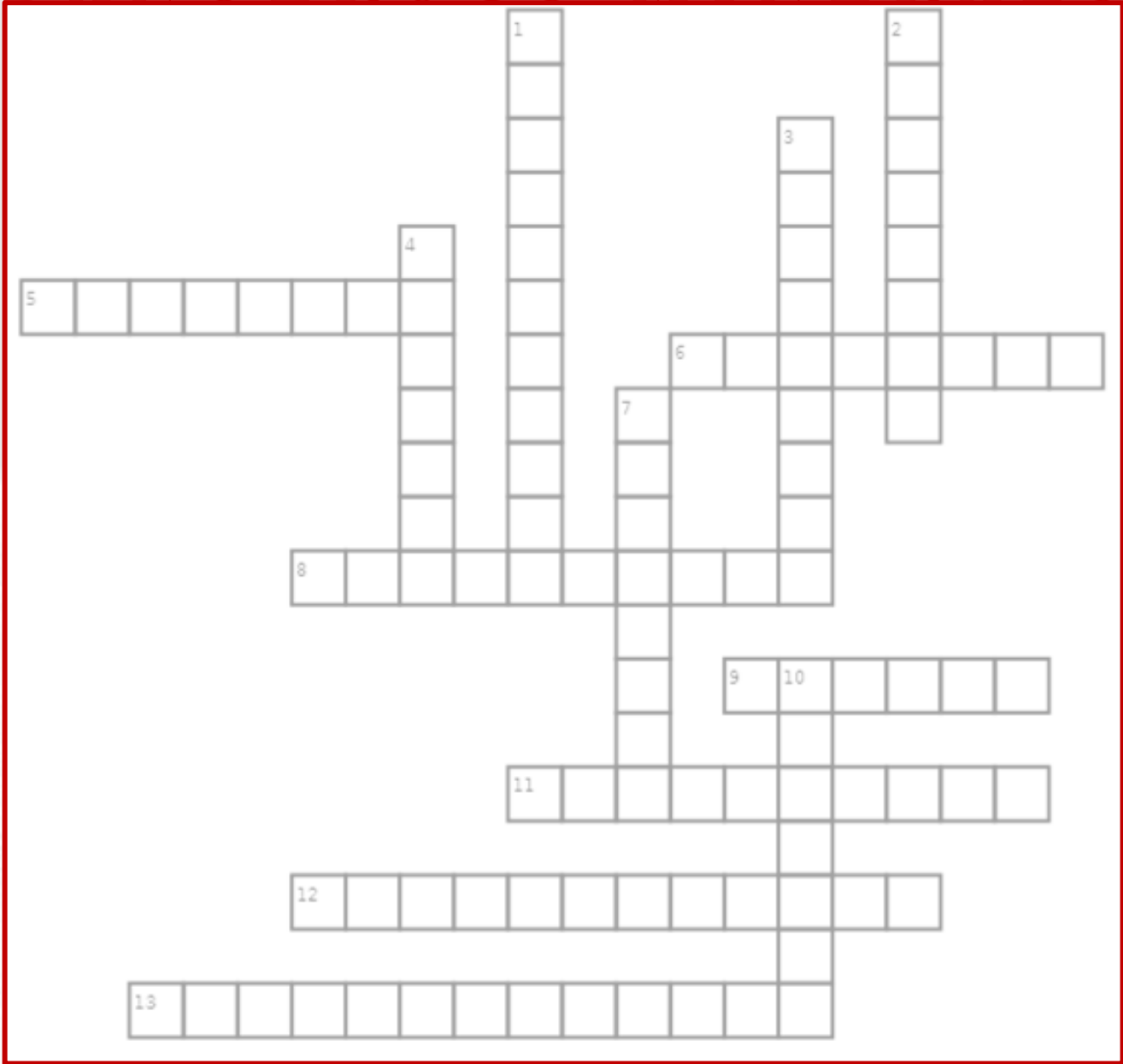
5. Smectite

6. Illite

7. Serpentine

8. Silicates

# DANGEROUS MINERALS



## DOWN:

1. Blue asbestos
2. Arsenic sulfide mineral
3. Uranium-rich mineral
4. Nicknamed "ruby sulfur"
7. Mercury sulfide
10. Brown asbestos

## ACROSS:

5. Secondary radioactive mineral
6. Sometimes called "antimonite"
8. Radioactive green mineral
9. Main ore of lead
11. White asbestos
12. Iron arsenic sulfide
13. Rare sulfosalt mineral

# FUN & GAMES

## ANSWER KEY

### SUNDANCE SEA

K E A R J D R T U T I N S D E  
Y G L E S Y A W K C A R T A I  
E I D P T R S I A C N S E I C  
T S Y E T H I K I C S T G D H  
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R S D I O N I R C L H N R L S

SUNDANCE  
TRACKWAYS  
AMMONITE

JURASSIC  
EPEIRIC  
TIDALFLATS

LIMEYMUD  
GRYPHAEA  
CRINOIDS

THEROPOD  
SEA  
ICHTHYOSAUR

# FUN & GAMES

## ANSWER KEY

### METAMORPHIC ROCKS

G T L N S S E I A K E A T E I  
I A M H E N T H G N I E I N S  
H N T S E Y A P O O C S T L K  
S I E A E S L T S L E L S E T  
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|          |           |            |            |
|----------|-----------|------------|------------|
| SLATE    | SOAPSTONE | SCHIST     | SERPENTINE |
| ECLOGITE | SKARN     | NOVACULITE | EPIDOTE    |
| GNEISS   | MIGMATITE | PHYLLITE   | HORNFELS   |

# AIPG PURPOSE

The purposes of the Institute shall include:

- advance the geological sciences and the profession of geology;
- establish qualifications for professional geologists;
- certify the qualifications of specific individual Member geologists to the public;
- promote high standards of ethical conduct among its Members and Adjuncts, and within the profession of geology; and
- represent, and advocate for, the geological profession before government and the general public.



# WHAT WE DO

Professional Certification - Certifies geologists based on their Competence, Integrity, and Ethics.

- Categories of Membership - Certified Professional Geologist, Professional, Early Career Professional, Associate, and Student.
- Ombudsman - Intervenes with regulatory boards and agencies on behalf of individual geologists, at the geologist's request. Information also is disseminated in cooperation with the Association of State Boards of Geologists.
- Lobbying - Presents testimony and position papers to Federal and State legislators and agencies on matters affecting geologists and geologists' employment opportunities. Exhibits at the National Conference of State Legislators.
- Liability Insurance - Provides access to insurance for errors and omissions, designed specifically for geologists.
- Continuing Education - Through online learning, publications, seminars, short courses, and field trips, provides educational opportunities for geologists, other scientists, engineers, and the general public.
- Supplemental, Life, and Accident Insurance - Provides access to a full line of supplemental, life, and accident insurance.
- International Comity - Through agreements with professional societies in other countries, provides access for its Members to professional registration, certification, or chartered status in those countries.
- State and Section Activities - State and regional sections work on local political issues and the professional status of geologists in their geographic areas. The Institute's sections around the country hold regular meetings, featuring educational programs covering important subjects of interest to professional geologists. One of the most worthwhile benefits of AIPG Membership is the opportunity to make personal contact at the local and State level; to meet fellow geologists; and to learn from them.

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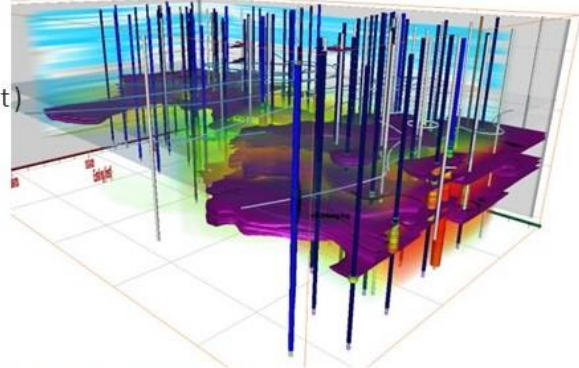
GOLD



# DIAMOND

## SITE CHARACTERIZATION

Membrane Interface Probe (MIP, MiHpt)  
Optical Image Profiler (OIP-UV, OIP-G, OiHpt)  
Hydraulic Profile Tool (HPT)  
3D Data Visualization & Modeling  
Ground Water Profiler (HPT-GWP)



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Dual-Tube Coring Systems  
Discrete Ground Water Sampling  
Monitor Wells, Piezometers



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COMPETENCE · INTEGRITY · ETHICS

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