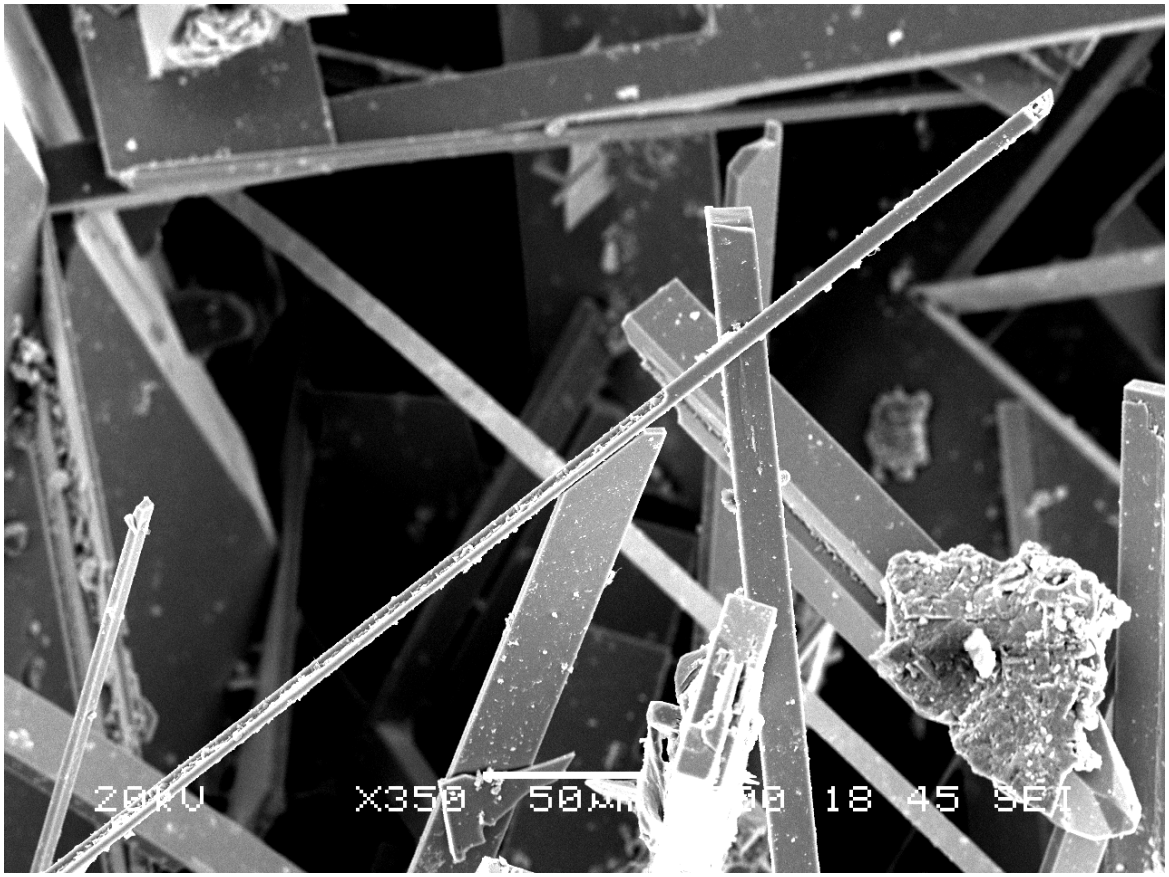
Friends of Mineralogy
Pennsylvania Chapter

Fall Symposium

Pennsylvania Mining and Mineralogy

November 5 & 6, 2016

Presented at
Franklin and Marshall College, Lancaster, Pennsylvania



SEM image of pyrite from Centre County; see page 6.

Friends of Mineralogy

Dedicated to the advancement of serious interest in minerals and related activities

We are collectors, professionals, and curators who share a love of mineral specimens and the desire to promote understanding and appreciation of mineralogy.

FM's objectives are to promote, support, protect and expand the collection of mineral specimens and to further the recognition of the scientific, economic and aesthetic value of minerals and collecting mineral specimens.

National FM newsletters, links to other chapters, and much more can be found on their web site: **www.friendsofmineralogy.org**

Friends of Mineralogy - Pennsylvania Chapter

provides:

- the benefits of membership in the national organization
- an annual Symposium in November
- field trips
- quarterly illustrated Newsletter
- an extensive WWW site with news, downloadable books, and more

Membership application forms are available on our web site

Please explore the FM-PA web site at

www.rasloto.com/FM/

Pennsylvania Mining and Mineralogy

Friends of Mineralogy - Pennsylvania Chapter
Fall Symposium November 5 & 6, 2016

SCHEDULE of EVENTS

Saturday, November 5:	**SYMPOSIUM**	**page**
8:30 to 9:00 a.m.	Registration	
9:00 to 9:10 a.m.	Opening Remarks	
9:10 to 9:50 a.m.	**Stan Mertzman, PhD, Franklin & Marshall College** **Spring Break in Hawaii, AKA: Volcano Boot Camp for F&M Mineralogy-Petrology Students**	**4**
9:50 to 10:20 a.m.	BREAK- Check out the silent auction and visit the dealers.	
10:20 to 11:00 a.m.	**Robert Kulp, MS, West Chester University** **The Dunite occurrence in the Serpentinites of the Pennsylvania - Maryland Chrome Mining District**	**5**
11:00 a.m. to 12:30 p.m.	LUNCH BREAK - lunch on your own (local map on back cover) Silent auction continues until 1:45 - Room 119 open during lunch	
12:30 to 1:10 p.m.	**Ryan Mathur, PhD, Juniata College** **Cenozoic mineralization ages for sulfides and calcite in Pennsylvania**	**6**
1:10 to 1:20 p.m.	FM-Pa Members: Chapter Membership Meeting	
1:20 to 2:10 p.m.	BREAK - Silent Auction ends at 1:45	
2:10 to 2:50 p.m.	**Bill Stephens, PG, Stephens Environmental** **Lapidary Grade Agate and Other Semi-Precious Gemstones from the Penn-MD Serpentine Quarry, Lancaster County, PA**	**7**
2:50 to 3:00 p.m.	Field Trip Instructions	
3:00 to 3:20 p.m.	Distribution of Prof. Development Hours certificates to PGs	
3:30 p.m.	Chapter Board of Directors meeting	
Sunday, November 6: ***Daylight Saving Time Ends***	**FIELD TRIP to Cornwall, Lebanon County** **For Symposium Registrants Only** ***See map & directions inside back cover***	**10**
9:00 a.m. to noon	Meet by 9:00 a.m. South end of Iron Valley Golf Club parking lot, Iron Valley Drive, Cornwall, Pa .	

Spring Break in Hawaii
AKA: Volcano Boot Camp for
F&M Mineralogy-Petrology Students

Stan Mertzman, PhD
Franklin & Marshall College

For the past several years I have taken the students in my Geo 322 course entitled "Igneous and Metamorphic Petrology" taught at Franklin and Marshall College to Hawaii over Spring Break. The educational goal is to provide students with an extended experience involving igneous rocks outside of the classroom. Hawaii, especially Hawaii Volcanoes National Park (HVNP), provides a safe, logistically simple, mostly decent weather venue for such an experience. A virtual field trip encompassing all five volcanoes that constitute the above sea-level portion of the island of Hawaii, specific landforms and volcanic features, lavas and their mineralogy in both hand sample and thin section, will be incorporated into a dynamic presentation.

Kilauea Iki crater

Students explore a lava tube

Biography

Dr. Stan Mertzman is the Earl D. Stage and Mary E. Stage Professor of Geosciences at Franklin and Marshall College.

The Dunite occurrence in the Serpentinites of the Pennsylvania - Maryland Chrome Mining District

Robert Kulp, MS
West Chester University

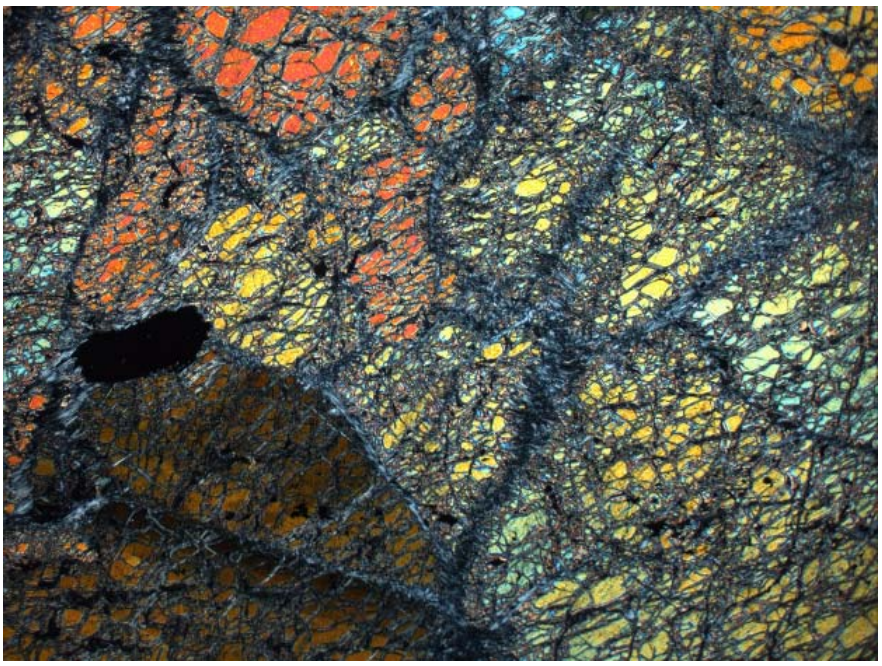
After examining thin sections of rocks I collected at the Penn-Md Materials Quarry in Fulton Twp, Lancaster County, it was readily apparent that upwards of 50% of the original forsteritic olivine is still present in some of these serpentinized dunites and peridotites. Previous research has indicated only about 5% preservation of forsterite in the State Line Serpentinites of Pennsylvania; H. L. McKague (1964)

Hand samples of the least altered rocks are black, gray and greenish grey in color. Olivine can be seen as glassy reflective crystals in this serpentinite. The least altered rocks quickly develop an orange-rust weathering on exposed surfaces. Some large blocks at the quarry show visible igneous layering of dunite and peridotite. Dunite forms thin bands, while peridotite forms thicker bands in some of these rocks. Original igneous textures and olivine crystals can also be seen on sawn surfaces with the naked eye, even better with a hand lens. Partly altered olivine has a brown color in some of the more serpentinized rocks at this quarry.

When seen with a polarizing microscope, olivine stands out from serpentine. Pyroxene is much more altered than olivine within these rocks. Least altered dunite is medium to coarse- grained, granular-textured forsteritic rock, consisting of what was almost 100% olivine. Original grain boundaries are indicated by thin lines of magnetite. Crisscrossing lines of serpentine are present in these olivines. Serpentine replaces the outer portions of some of these crystals.

Very little of original pyroxene is unaltered in the serpentinized peridotites seen in thin section. These crystals are now mostly serpentine and magnetite. They appear black even in hand samples. I have determined that this pyroxene is clinopyroxene from extinction angles seen with a polarizing microscope. This indicates this peridotite was wehrlite before its partial alteration to serpentinite.

McKague (1964) sampled rocks exposed at the nearby Cedar Hill Quarry. Why there is a dramatic change in preservation of original mineralogy between these two nearby localities is an interesting question.



Mostly unaltered dunite in thin section, sample PA-220 from Penn-MD Materials Quarry, 1.5x CPL.

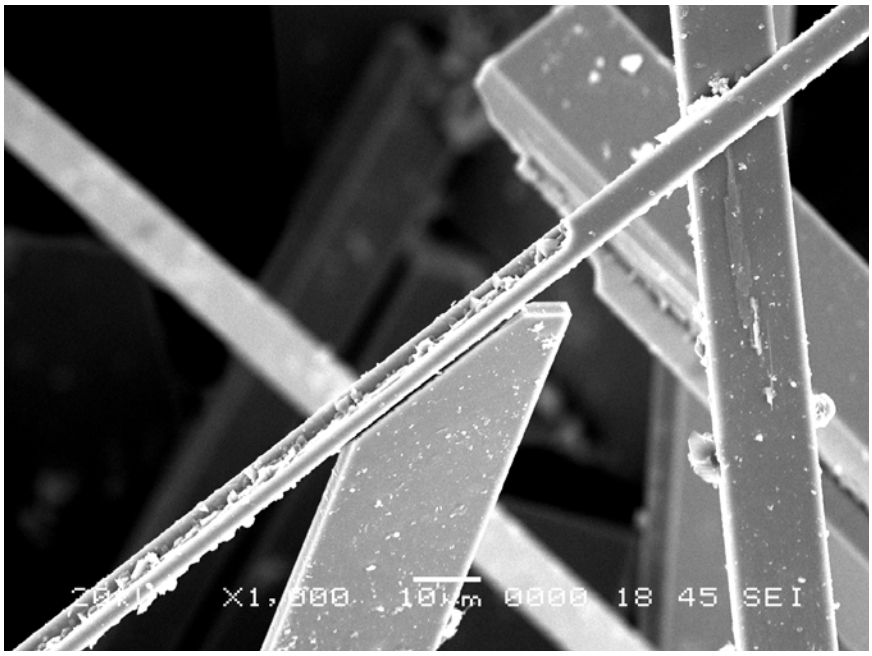
Biography

Robert Kulp holds an MS degree from West Chester University, and is a candidate for a PhD. He most recently spoke to our Symposium in 2014, on Xenoliths of the Triassic Passaic Formation in the Monocacy Hill diabase intrusion, Amity Township, Berks County, Pennsylvania.

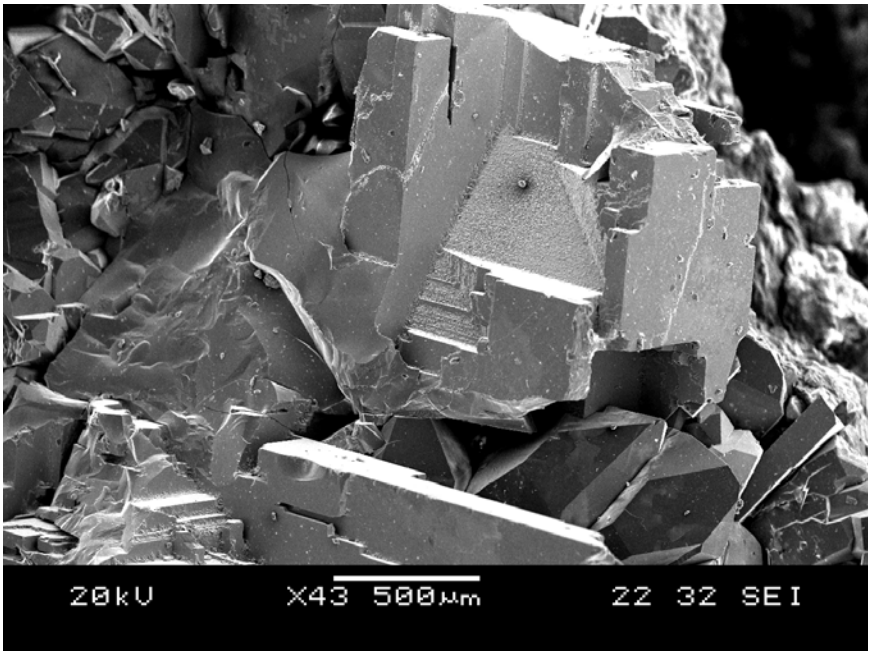
Cenozoic mineralization ages for sulfides and calcite in Pennsylvania

Ryan Mathur, PhD
Juniata College

An important aspect to understanding why minerals occur in certain area relates to the timing at which they were emplaced. This contribution presents Re-Os ages of sulfides from 6 locations and Pennsylvania and 2 from New Jersey along with U-P ages of calcite from 1 location from Pennsylvania and 3 from Ohio. The mineral ages are significantly younger than known hydrothermal activity in the area (ages span ranges from 40 to 7MA). Multiple hypotheses will be discussed to explain the ages such as fluid migration spurred by large earthquakes and/or the Chesapeake Bay impact.



Scanning electron microscope images of pyrite from the “Skytop” Interstate 99 excavation west of State College, Centre County, Pennsylvania; timing of their emplacement will be discussed.



Biography

Dr. Mathur is Professor of Geology and Chair of the Geology Department at Juniata College in Huntingdon, Pennsylvania. His research interests include minerals exploration, economic geology, and various aspects and methods of geochronology.

Lapidary Grade Agate and Other Semi-Precious Gemstones from the Penn-MD Serpentine Quarry, Lancaster County, PA

Bill Stephens, PG
Stephens Environmental Consulting, Inc.

The Haines & Kibblehouse Penn-MD Materials Quarry, located in southeastern Lancaster County, PA, adjacent to the world famous Cedar Hill Quarry, was opened in the early 1990s. I was enthusiastic that lapidary grade williamsite might be uncovered in this new mine as it had been in the earlier workings of Cedar Hill. Initial development work involved panning and stockpiling overburden, preparation of a portion of the site for crushing and separation facilities, product storage stockpile areas, scale house, office and an initial bench cut. I obtained permission to explore the initial cut and the stockpiled overburden. The serpentine on the upper bench was deeply weathered, and contained colorful serpentine weathering products and some drusy quartz vein fillings, but no williamsite.

While perusing the overburden stockpile, I noticed chalky-surfaced misshapen nodules resembling amygdule fillings. I collected perhaps a dozen or so, many of which rolled out free on the toe of slope of the large pile, and subsequently cut several open to discover a beautiful smoky bluish to yellowish translucent agate with fine to medium black specks of presumably manganese resembling dendrites. All of the quality material was slabbed and a few pieces were cabbed into beautiful gems. All of that material has now been cut or sold and was quite popular with cutters who likened it to "Amethyst Sage" from Montana.

Access was denied after a time due to corporate concerns about liability, and I did not return until the DMS obtained permission to collect in 2013. During that field trip, a few pieces of Deweylite, and a stockpile of several hundred pounds of hydrothermal cryptocrystalline quartz vein agate/chalcedony were discovered along with a small amount of low grade williamsite (a translucent jade green serpentine gem). A couple of pieces of deweylite and the vein agate, some of which resembles butterscotch lozenges or carnelian, have been polished. On a recent visit this year (2016), some low quality williamsite was discovered. With the expansion of this quarry south across the Maryland line planned for the near future, more agate amygdules may be uncovered.

Biography

Bill Stephens is a licensed professional geologist and owner of Stephens Environmental Consulting, Inc. Mr. Stephens holds a bachelor of Science and a Master of Science, both in Geology, from the University of Pittsburgh. Mr. Stephens has owned and operated a private environmental consulting and civil design firm for over 20 years. Mr. Stephens has been collecting since the age of 12, and is a member of the FoM-PA Chapter Board of Directors.

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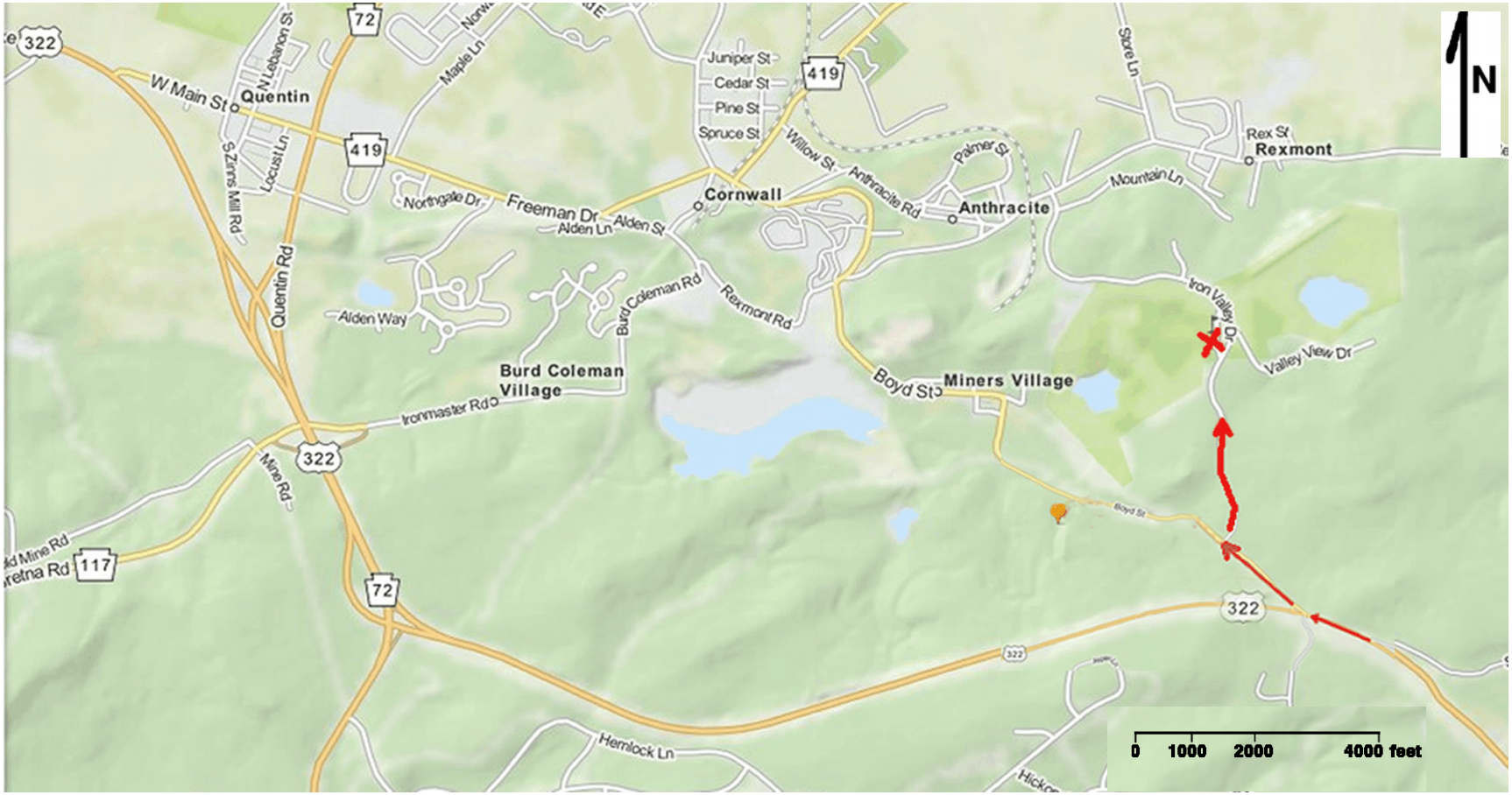


CORNWALL, PENNSYLVANIA, AREA Mapquest Map Builder Beta and Mapquest.com

DIRECTIONS TO FIELD TRIP SIGN-IN, IRON VALLEY GOLF CLUB PARKING LOT, CORNWALL, PA

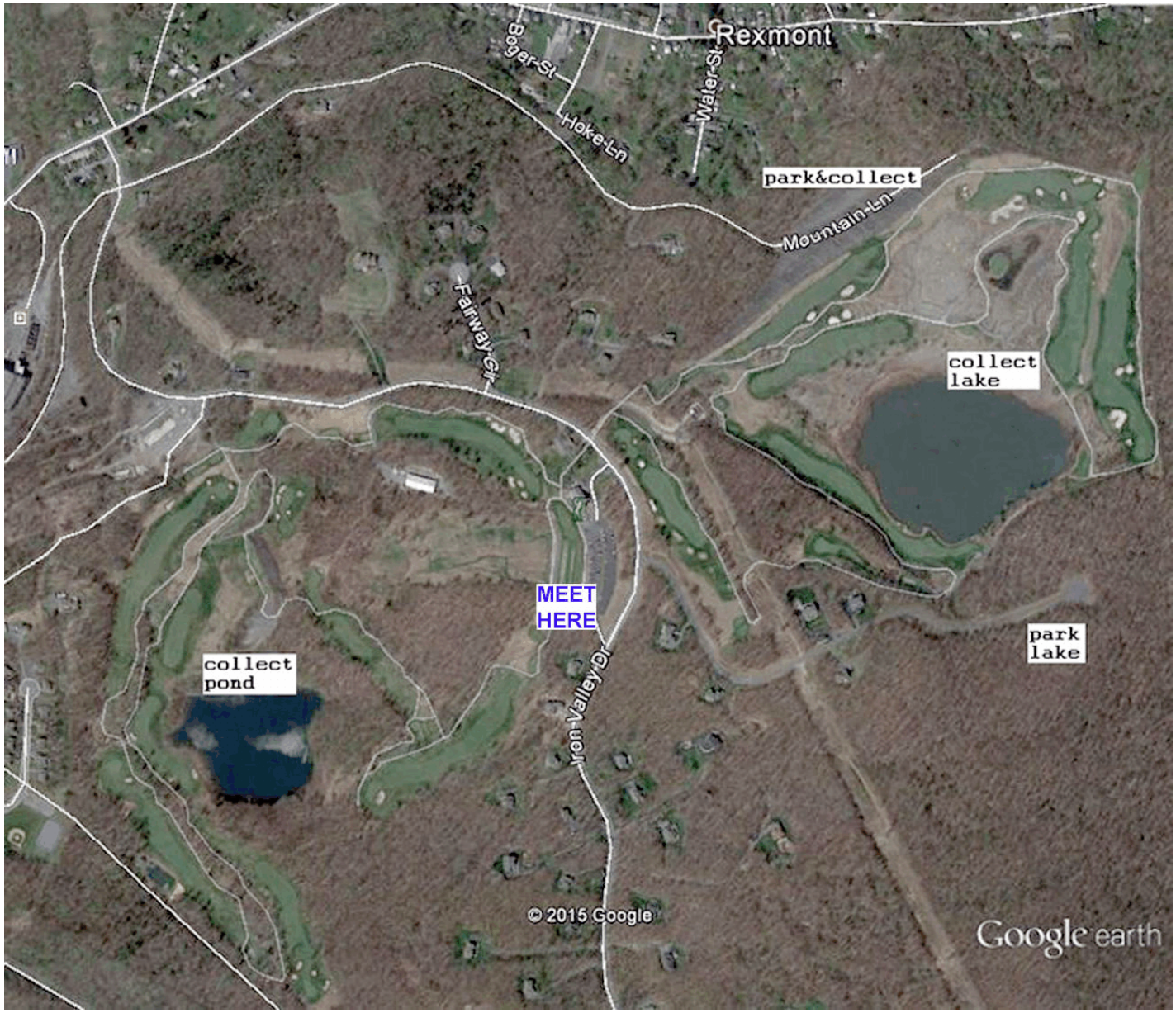
From the Lancaster area, go north on PA 501 (Lititz Pike, straight through Lititz, PA) approximately 12 miles.

At traffic light in Brickerville, turn left on US 322 West and go 5.0 miles.

In the middle of the woods in a valley, bear right onto Boyd Street and go 0.3 miles. Turn right on Iron Valley Drive.

Go 0.6 miles, turn in to the parking lot on left, meet the group by 9:00 a.m. EST.

GPS from Golf Club's web site: 201 Iron Valley Dr, Lebanon, PA 17042



Field trip: Meet by 9:00 a.m. at the southern end of the Iron Valley Golf Club parking lot to sign in.

1 Lisa Bonchek Adams Auditorium in Kaufman Hall
2 Admission, Wohlsen House, *637 College Avenue*
3 Alumni Sports & Fitness Center, *929 Harrisburg Avenue*
4 Appel Infirmary
→ Asian Cultural Center, *see Multicultural Affairs*
5 Arts House, *602 West James Street*
6 Baker Campus, *1300 block of Harrisburg Pike*
7 Ann & Richard Barshinger Center for Musical Arts in Hensel Hal l
8 Ann & Richard Barshinger Life Sciences & Philosophy Building
9 Black Cultural Center, *615 College Avenue*
10 Bonchek College House
→ Bookstore, *see Distler House*
11 Brooks College House
12 Brooks Tennis Center
13 Buchanan House
14 Business Office, *644–646 Race Avenue*
15 Career Services, *619 College Avenue*
16 Centennial Conference Office, *HEDS Consortium, Frederick Street entrance of Lancaster Theological Seminary*
→ College Guest House, *see Huegel Alumni House Annex*
17 College Row
18 College Square
→ Counseling Center, *see Appel Infirmary*
19 Diagnothian Hall
20 Dietz Hall
21 Distler House/Campus Bookstore
22 Facilities Services, *415 Harrisburg Avenue*
23 Faculty, Emeriti Faculty & Foreign Language Tutor Offices, *711 College Avenue*
24 Financial Aid, *617 College Avenue*
25 Franklin-Meyran Hall
26 French House, *548 West James Street*
27 Gerhart House
28 Goethean Hall
29 Green Room Theatre
30 Hackman Physical Sciences Laboratories
31 Patricia E. Harris Center for Business, Government & Public Policy
32 Hartman Green
33 Dr. Leon Herman Arts Center
34 Huegel Alumni House
35 Huegel Alumni House Annex,
→ College Guest House *445 College Avenue*
36 International House, *446–448 West James Street*
37 James Street Apartments, *534 West James Street*
38 Jazzman's Cafe & Bakery
39 Joseph International Center, *701 College Avenue*
→ Kaufman Hall, *see Lisa Bonchek Adams Auditorium in Kaufman Hall*
40 Keiper Liberal Arts
41 Klehr Center for Jewish Life, *645 College Avenue*
42 Kunkel Aquatic Center, *929 Harrisburg Avenue*
43 Marketplace Dining Hall
44 Martin Library of the Sciences
45 Mayser Physical Education Center
→ Meyran Hall, *see Franklin-Meyran Hall*
46 Multicultural Affairs, *625 College Avenue*
47 The President's House, *508 North School Lane*
48 New College House
49 New Street Studio
50 North Museum
51 Office of Student Academic Affairs, *623 College Avenue*
52 Old Main
53 Other Room Theatre
54 Philadelphia Alumni Writers House, *633 College Avenue*
55 Phillips Museum of Art
56 POGIL, *713 College Avenue*
57 Public Safety
58 Roschel Performing Arts Center
59 Schnader Residence Hall
60 Shadek-Fackenthal Library
61 Sponaugle-Williamson Field
62 Stager Hall
63 Stahr Auditorium
64 Steinman College Center
65 Sustainability House, *550–52 West James Street*
66 Thomas Residence Hall
67 Tylus Field: *Ken Gramas Pavilion*
68 Ware College House
→ Warehouse, *see Facilities Services*
69 Weis College House
70 Carolyn W. & Robert S. Wohlsen Center for the Sustainable Environment
→ Writers House, *see Philadelphia Alumni Writers House*