

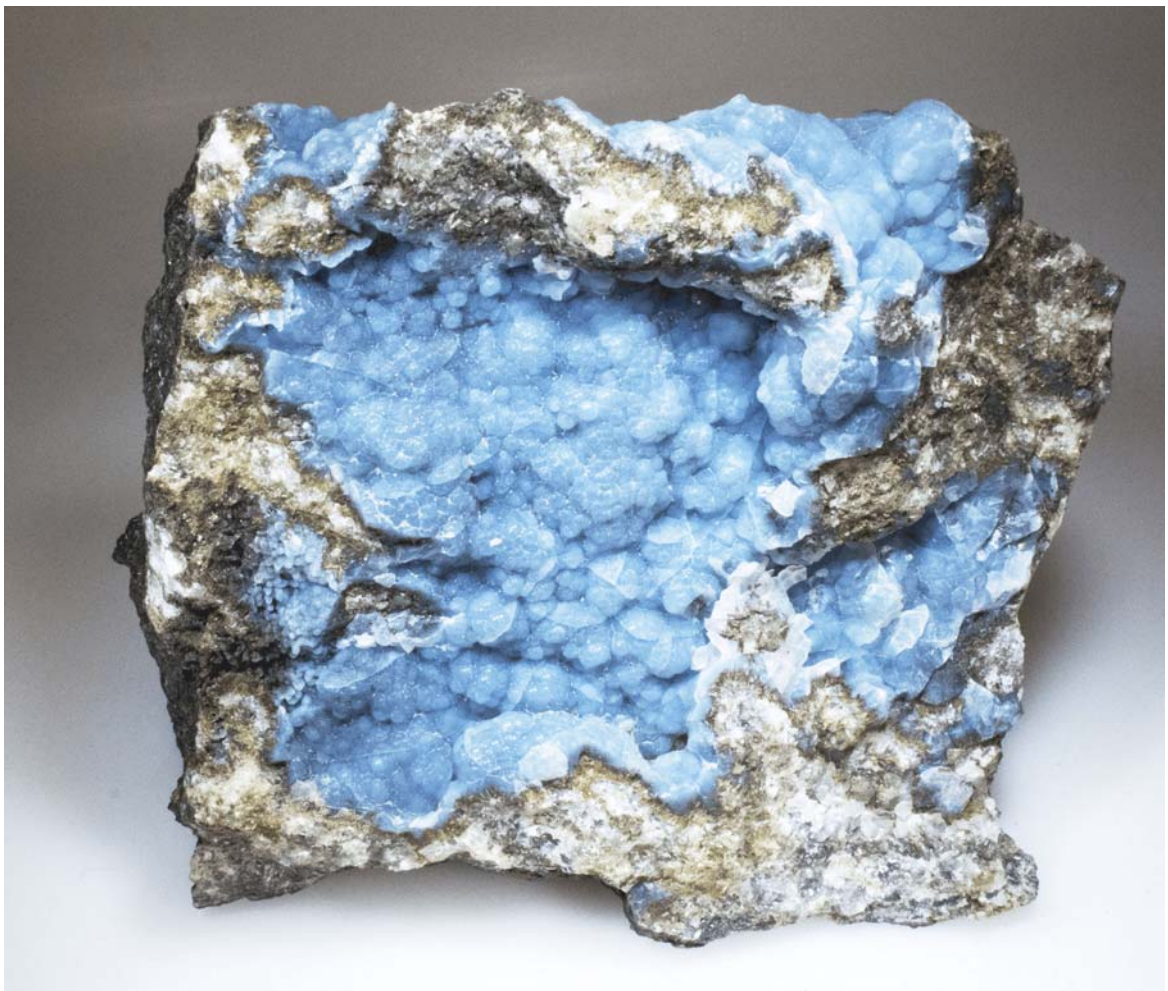
**Friends of Mineralogy
Pennsylvania Chapter**

Fall Symposium

**Pennsylvania
Mining and Mineralogy**

November 4 & 5, 2017

**Presented at
Franklin and Marshall College, Lancaster, Pennsylvania**



Opal from the Dyer Gibraltar quarry, 7.5 cm. Ron Sloto photograph and collection. 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

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www.rasloto.com/FM/

Pennsylvania Mining and Mineralogy
Friends of Mineralogy - Pennsylvania Chapter
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SCHEDULE of EVENTS

Saturday, November 4: SYMPOSIUM		<u>page</u>
8:30 to 9:00 a.m.	Registration	
9:00 to 9:15 a.m.	Opening Remarks	
9:15 to 10:00 a.m.	Stan Mertzman, PhD, Franklin & Marshall College Through the “Looking Glass”: Optical Mineralogy and Common Igneous and Metamorphic Minerals and Rocks	5
10:00 to 10:15 a.m.	FM-Pa Members: Chapter Membership Meeting	
	<u>also</u>	
10:00 to 10:45 a.m.	BREAK- Check out the silent auction and visit the dealers.	
10:45 to 11:30 a.m.	Ronald A. Sloto, PG, West Chester University The Dyer Diabase Quarries, Berks County, Pennsylvania	6
11:30 a.m. to 1:00 p.m.	LUNCH BREAK - lunch on your own (local map on back cover) <u>Silent auction continues until 1:15</u> - Room 119 open during lunch	
1:15 p.m.	Silent Auction ends	
1:30 to 2:15 p.m.	Bill Stephens, PG, Stephens Environmental Lapidary Grade Agate and Other Semi-Precious Gemstones from the Penn-MD Serpentine Quarry, Lancaster County, Pa.	8
2:15 to 3:00 p.m.	William Kochanov, PhD, Pennsylvania Geologic Survey The Occurrence of Smoky Quartz Crystals in Northeastern Pennsylvania	11
3:00 to 3:15 p.m.	BREAK	
3:15 to 4:00 p.m.	Kent Littlefield, PG, Leidos Friedensville Zinc Mines of Southern Lehigh County: Geology, Industrial History, and Environmental Impact	12
4:00 to 4:10 p.m.	Field Trip Instructions	
4:10 to 4:30 p.m.	Distribution of Prof. Development Hours certificates to PGs	
4:30 p.m.	Chapter Board of Directors meeting	
Sunday, November 5:	FIELD TRIP to Peach Bottom, Lancaster County	14
Daylight Saving	For Symposium Registrants Only	
Time Ends	<i>See maps inside back cover</i>	
9:00 a.m. to noon	Meet by 9:00 a.m. H&K Group Penn/MD Quarry, 303 Quarry Rd., Peach Bottom, PA 17563. The quarry is located off of US Rte. 222 just north of the Maryland state line.	

NOTES

Through the “Looking Glass”: Optical Mineralogy and Common Igneous and Metamorphic Minerals and Rocks

Dr. Stan Mertzman*
Franklin & Marshall College
Department of Earth and Environment

Correctly identifying a mineral usually follows a natural progression wherein the tool being used to help your eyes increases in sophistication along the way. From using a hand lens, the next step often involves a petrographic microscope that is equipped with 3 or 4 lenses of increasing magnification. This tool opens the door to a whole new world called optical mineralogy and petrography. Using the minerals of Bowen’s Reaction Series, a concept that includes many of the most common minerals found in Earth’s crust, I will escort you through a micro-world that contains an amazing amount of useful geologic information.

Biography

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

* I am on sabbatical leave during the 2017 – 2018 academic year. What that means is a refocus of much of my time from teaching to research. So keep an eye out in the journal *American Mineralogist* in the spring of 2018 for an article concerning fumarolic alteration associated with the 1974 lava flow from Kilauea Volcano in Hawaii and a second article in the journal *Icarus*, a journal which focuses on planetary science, concerning garnet and its spectral characteristics as a function of garnet’s chemical composition. Also, not teaching in the fall permitted me to do a stint of field work on the western margin of Mount Shasta, a dormant volcano in northern-most California. See the three images on this page. All three were taken by me. The image above is Mount Shasta, below left is Black Butte, and the 3rd is a selfie.



The Dyer Diabase Quarries, Berks County, Pennsylvania

**Ronald A. Sloto, P.G.
West Chester University**

The John T Dyer Company operated three quarries in the vicinity of Birdsboro during the first half of the Twentieth Century—the Trap Rock, Monocacy, and Gibraltar quarries. All three quarries were in diabase of the St. Peters-Birdsboro diabase sheet. Two of the quarries are still in operation. The first quarry opened by Dyer was the Trap Rock quarry south of Birdsboro. John T. Dyer, a railroad contractor, operated a limestone quarry in Chester County; however, the railroads demanded a rock harder than limestone for ballast. William Johnson, superintendent of the limestone quarry, investigated a hard rock about 1 mile south of Birdsboro, which proved to be an excellent railroad ballast material. In 1893, Dyer secured a 30-year lease on the 364-acre property from the E & G Brooke Land Company and opened the Trap Rock quarry. At this location, Dyer operated three quarries close to each other; two quarries were on the right bank of Hay Creek, and one was on the left bank. In 1924, when the Dyer Company attempted to renew the lease, it learned that the Birdsboro Stone Company, which operated the nearby Monocacy quarry, had secretly negotiated and signed a lease with Brooke for the Trap Rock quarry. Dyer decided to open a new diabase quarry on Monocacy Hill, across the Schuylkill River from Birdsboro. When Dyer's purchase of Monocacy Hill became public, there were protests by many residents who thought the company would remove the local landmark by quarrying it away. Dyer suspended work on the new quarry in response to the protests. During this time, Dyer was engaged in a bitter court battle with the Birdsboro Stone Company over the Trap Rock quarry. The litigation ended when Dyer bought the Birdsboro Stone Company, which included the Monocacy quarry. In 1957, at the expiration of its lease, Dyer abandoned the Trap Rock quarry. The quarry property was purchased by Haines and Kibblehouse, Inc., who planned to reopen the quarry. The reopening was fought by Robeson Township for 12 years. The fight went all the way up to the Pennsylvania State Supreme Court, which refused to hear the case. A mining permit was issued by in March 1999, and the quarry reopened. The quarry is currently known as the H&K Group Birdsboro Materials quarry.

The Dyer Monocacy quarry was opened by the Schuylkill Stone Company in 1908. About a year later, the company was acquired by the Birdsboro Stone Company, which operated the quarry until 1925 when Dyer purchased the company to settle a lawsuit over the Trap Rock quarry. Dyer abandoned the quarry in 1956. French Creek State Park acquired the quarry property in 1974 to protect the land from commercial development.

The Dyer Gibraltar quarry has been known by many names: the Birdsboro, Clingan, Gibraltar, Gickerville, and Robeson quarry. In 1911, Dyer purchased the Gibraltar quarry property to increase production and secure a shipping location on a railroad other than the Wilmington & Northern Railroad. The quarry, known as the Dyer Clingan plant, was in operation and producing crushed stone by 1913. In 1968, the Warner Company purchased the Dyer quarry and operated it until Warner was purchased by Waste Management, Inc. in 1990. In 1998, the quarry was purchased by James J. Anderson, the current owner, and its name was officially changed to Dyer Quarry, Inc.

The diabase in the quarries is massive and sparsely mineralized. Minerals occurring here are green, mammillary prehnite and cubic apophyllite crystals, often associated with zeolite minerals. The zeolite minerals include chabazite as colorless or white rhombohedra, heulandite in small colorless to yellow crystals, chalky white laumontite, acicular natrolite crystals, radiating needles of scolecite, stellerite and stilbite in sheaf-like aggregates, and thomsonite in minute crystals. Calcite is found as white to brown rhombohedrons that fluoresce. Among the unusual minerals that occur in these quarries are babingtonite in tiny black prisms, erythrite, blue opal, okenite, sphalerite, and thaumasite.

Biography

Ron Sloto is on the research faculty of West Chester University, and he is the curator for the mineral collection at the University. He conducts research on the chemical composition of minerals of southeastern Pennsylvania. Ron Sloto retired from the U.S. Geological Survey in January 2015 after a 41-year career that included publication of over 80 reports, journal articles, and abstracts. The HYSEP hydrograph-separation computer program he developed is in worldwide use. Ron has been a mineral collector since the age of 5 and also has a keen interest in history. He has published books on the mining history and mineralogy of Chester County (“The Mines and Minerals of Chester County, Pennsylvania”) and Berks County (“The Mines and Minerals of Berks County, Pennsylvania”). He is currently working on a similar effort on Montgomery County mining history and mineralogy. He is a frequent contributor to the Friends of Mineralogy Pennsylvania Chapter and National newsletters.



Prehnite from the Birdsboro Materials (Dyer Traprock) quarry, 6.5 cm. Ron Sloto photograph. Scott Snavely collection.



Natrolite from the Dyer Gibraltar quarry. Ron Sloto photograph and collection.



Stilbite-stellerite solid solution series, Dyer Monocacy quarry, 8.5 cm. Ron Sloto photograph. Steve Carter collection.



Calcite from the Dyer Gibraltar quarry, 7.5 cm. Ron Sloto photograph. Carnegie Museum of Natural History Brookmyer collection.

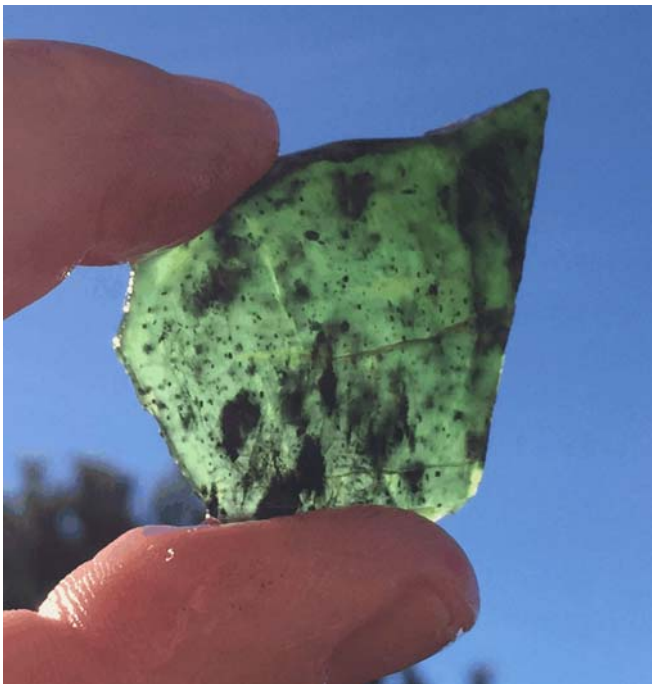
See also front cover photo: Opal from the Dyer Gibraltar quarry, 7.5 cm. Ron Sloto photograph and collection.

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

**Bill Stephens, PG
Stephens Environmental**

The Haines & Kibblehouse Penn-MD Materials Quarry, located in southeaster Lancaster County PA adjacent to and on the westerly side of the world-famous Cedar Hill Quarry, was opened in the early 1990's. 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. The initial cut and the stockpiled overburden were examined in 1992-93. 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, chalky-surfaced misshapen nodules resembling amygdule fillings were observed. Many of these nodules had rolled down to the toe of slope of the large pile. The nodules were subsequently slabbed exposing 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.



NOTES

The Occurrence of Smoky Quartz Crystals in Northeastern Pennsylvania

**William Kochanov, PhD
Pennsylvania Geologic Survey**

Quartz crystals have been reported from numerous localities in northeastern Pennsylvania. Aside from the well-known and now closed White Haven locality in Luzerne County, the greater majority are largely undocumented “word of mouth” localities with pedigrees attributed to a county or nearby municipal qualifier.

Euhedral quartz crystals, milky to water-clear, are generally the norm occurring along sandstone fractures and fault planar surfaces. Displays of this secondary crystal growth are commonly observed as “sparkly” micro-quartz crystal mosaics best seen on properly angled rock surfaces on sunny days. Other occurrences range from druzy coatings to clusters of singly (up to 10 cm L x 3 cm in diameter) to doubly terminated types range (up to 3 cm L x 2cm in diameter). The majority of crystals are relatively small, 3 cm or less in length and several mm to 1 cm in diameter on average.

Bedrock mapping projects in the Northern Anthracite Field (1997-98), and Wayne and Susquehanna Counties (2015-17) has uncovered two rather unique occurrences of smoky quartz crystals. The first occurrence was found along a fault plane in tectonically folded Pennsylvanian-age sandstone (Lackawanna County). The second occurrence however, occurred along north-south trending joint surfaces in relatively flat-lying, Devonian-age sandstone (Susquehanna County). An additional smoky quartz locality has recently been publicized for Schuylkill County.

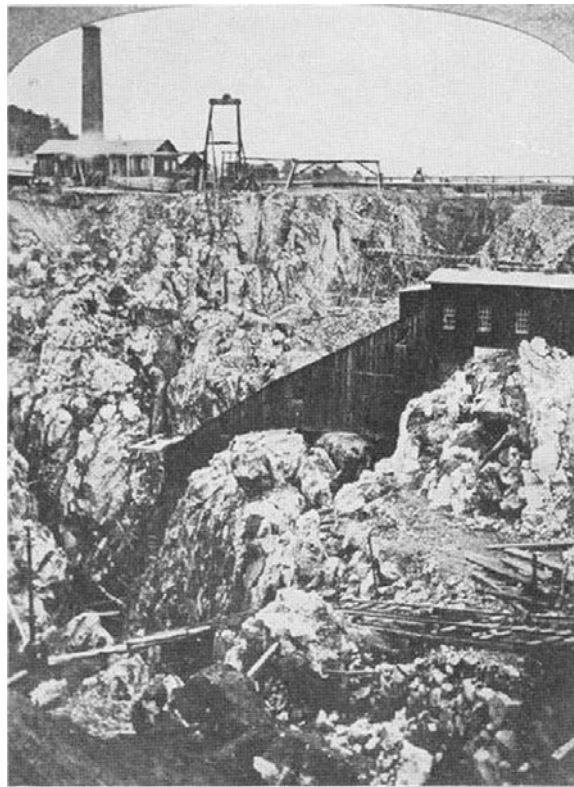
The occurrences in differing geologic units and apparently different structural regimes resulted in speculation as to whether there was an unknown relationship between the two. Were they related to a common geologic structure (i.e., fracture, fault, lineament) or orogenic event?

Fluid inclusions, discovered within the Susquehanna County crystals, are presently being analyzed using the heating and freezing technique in determining pressures and temperatures of the formation and original composition of the fluids/gases within the crystals. This may add significant data in the interpretation of thermogenic gas signatures within the Catskill Formation and deeper gas plays of the Marcellus and Utica Formations which in turn may help resolve stray gas environmental issues within regional aquifers or perhaps refine future gas drilling prospects.

Friedensville Zinc Mines of Southern Lehigh County: Geology, Industrial History, and Environmental Impact

**Kent Littlefield, PG
Leidos**

An ore-body that yielded over 820,000 tons of zinc was located in the Saucon Valley, Lehigh County, Pennsylvania. The Saucon Valley is a 26-square mile basin underlain by soluble limestone and surrounded by hard rock ridges. Zinc discovery near the Friedensville Church was accidental when a farmer noticed his field was sterile of plant growth. In 1845, a surveyor and mineral collector tested some specimens and identified them as sphalerite (zinc sulfide). Mining commenced in 1853, and five mines were producing high grade (>25%) zinc ore yielding up to 120,000 tons of metal between 1859 and 1893. Origin of the ore is not clearly known, and with greater than 100 feet of soil and intense deformation of the rocks, the geology is challenging. Groundwater was a major problem, and in the 1870's the largest steam pump in the world was constructed at the mines. Ulysses S. Grant was to dedicate the pump, but he apparently never made it from a local watering hole. In 1893, mining was abandoned due to high groundwater flows.



Ueberroth mine, Friedensville, about 1877, showing mill and open cut.

The mine lands and minerals were sold to the New Jersey Zinc Company (NJZ) in 1899. NJZ explored the ore body for the next 54 years, opening the New Hartman Mine in 1953. Following a shallow dipping ore body to the southwest and deepening the mine to over 2000 feet, NJZ mined up to 2,500 tons of ore per day, producing an additional 700,000 tons of zinc. Groundwater was a constant problem requiring pumping up to 46 million gallons per day. Most of the wells in the Saucon Valley were pumped dry. Saucon Creek, punctuated by sinkholes in the stream bed, was lined to reduce infiltration. Over 200 sinkholes occurred during the period of mining. Two roads, three residences, and a mine building were destroyed by sinkholes and subsidence. In 1983, the mining and pumping ceased; not because of exhaustion of the resource, but the high groundwater flows made mining too costly. Flow to Saucon Creek had to be augmented for 5 years, else it would have entirely ceased while groundwater in the valley returned to pre-mining levels.

The environmental consequences of the Friedensville mines remain, but some benefits are apparent. NJZ smelted the ore in Palmerton, which became a Superfund Site from heavy metals. Over 55 acres of tailings, which may also contain heavy metals, remain on the mine lands. Upper Saucon Township enacted one of the most comprehensive geology ordinances in the State to

protect both the groundwater and structures. The former mine lands are being redeveloped into a high quality office/technology park. The flooded New Hartman Mine, containing over a billion gallons of water with a recharge rate of 23 million gallons per day, is now a huge subsurface reservoir for the Township.

Biography

Kent Littlefield is a licensed professional geologist applying earth and physical sciences to the solution of land and water issues for over 38 years. Specializing in the analysis of geologic influences on groundwater and soil, he solves issues of groundwater and soil contamination, water supply, and geologic hazards. One of his long-standing clients is Upper Saucon Township, Lehigh County, PA, where he is the "Township Geologist". In this role, he assists in evaluating land development issues related to land stability, sinkholes, and storm water. His interest in mining led to collection of information on the Friedensville Zinc Mines, which underlie the Township and provide challenging land stability conditions. Mr. Littlefield has conducted geologic work in 29 U.S. states, Iceland, and Italy.



Lancaster

US Rt 222

Penn/MD



H&K Penn/MD Materials Quarry

US Rt 222 Lancaster -->

Quarry Rd
PA

Maryland

Tour Guide 1992

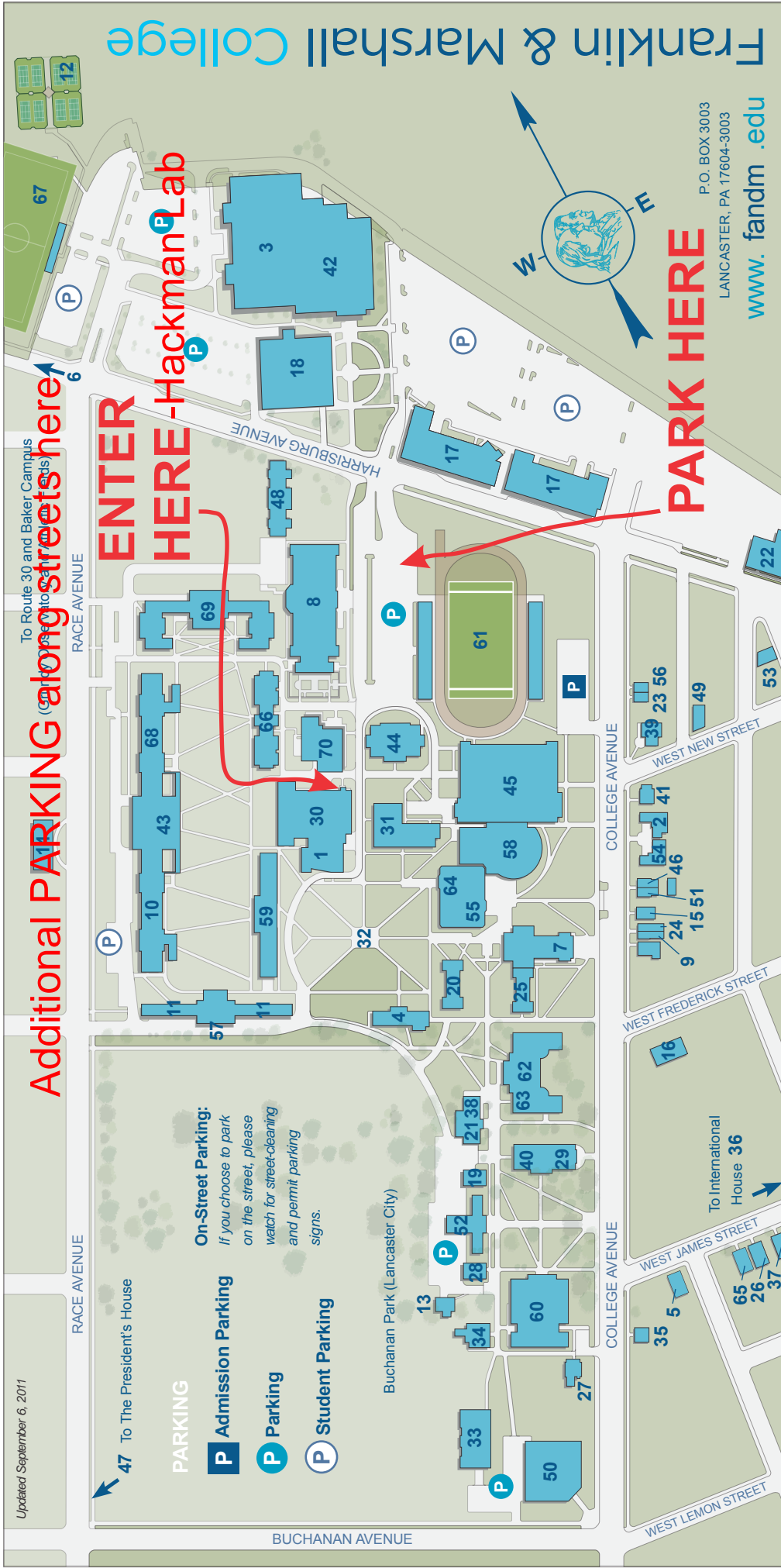
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Imagery Date: 8/27/2016 39°43'25.75" N 76°08'58.35" W elev 445 ft eye alt 3035 ft



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- P** Admission Parking
- P** Parking
- P** Student Parking

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|---|---|---|---|--|---|---|
| 1 Lisa Bonchek Adams Auditorium in Kaufman Hall, 637 College Avenue | 10 Bonchek College House Bookstore, see Distler House | 19 Black Cultural Center, 615 College Avenue | 28 Distler House/Campus Bookstore | 37 James Street Apartments, 534 West James Street | 46 Multicultural Affairs, 625 College Avenue | 62 Stager Hall |
| 2 Admission, Wohlsen House, 637 College Avenue | 11 Brooks College House | 20 Dietz Hall | 22 Facilities Services, 415 Harrisburg Avenue | 38 Jazzman's Cafe & Bakery, 701 College Avenue | 63 Stahl Auditorium | 63 Stahr Auditorium |
| 3 Alumni Sports & Fitness Center, 929 Harrisburg Avenue | 12 Brooks Tennis Center | 21 Patricia E. Harris Center for Business, Government & Public Policy | 23 Faculty, Emeriti Faculty & Foreign Language Tutor Offices, 711 College Avenue | 39 Joseph International Center, 701 College Avenue | 64 Steinman College Center | 64 Steinman College Center |
| 4 Appel Infirmary Asian Cultural Center, see Multicultural Affairs | 13 Buchanan House | 22 Hartman Green | 24 Financial Aid, 617 College Avenue | 40 Kaufman Hall, see Lisa Bonchek Adams Auditorium in Kaufman Hall | 65 Sustainability House, 550-52 West James Street | 65 Sustainability House, 550-52 West James Street |
| 5 Arts House, 602 West James Street | 14 Business Office, 644-646 Race Avenue | 23 Dr. Leon Herman Arts Center | 25 Centennial Conference Office, HEDS Consortium, Frederick Street entrance of Lancaster Theological Seminary | 41 Klehr Center for Jewish Life, 645 College Avenue | 66 Thomas Residence Hall | 66 Thomas Residence Hall |
| 6 Baker Campus, 1300 block of Harrisburg Pike | 15 Career Services, 619 College Avenue | 24 International House | 26 French House, 548 West James Street | 42 Kunkel Aquatic Center, 929 Harrisburg Avenue | 67 Tylus Field: Ken Gramas Pavilion | 67 Tylus Field: Ken Gramas Pavilion |
| 7 Ann & Richard Barshinger Center for Musical Arts in Hensel Hall I | 16 Centennial Conference Office, HEDS Consortium, Frederick Street entrance of Lancaster Theological Seminary | 25 International House | 27 Gerhart House | 43 Marketplace Dining Hall | 68 Ware College House | 68 Ware College House |
| 8 Ann & Richard Barshinger Life Sciences & Philosophy Building | 17 College Row | 26 French House, 548 West James Street | 28 Green Room Theatre | 44 Martin Library of the Sciences | 69 Warehouse, see Facilities Services | 69 Warehouse, see Facilities Services |
| 9 Black Cultural Center, 615 College Avenue | 18 College Square | 27 French House, 548 West James Street | 29 Green Room Theatre | 45 Maysor Physical Education Center | 70 Weis College House | 70 Weis College House |
| | 19 Counseling Center, see Appel Infirmary | 28 Gerhart House | 30 Hackman Physical Sciences Laboratories | 46 Multicultural Affairs, 625 College Avenue | | |
| | 20 Diagonthian Hall | 29 Green Room Theatre | 31 Patricia E. Harris Center for Business, Government & Public Policy | 47 The President's House, 508 North School Lane | | |
| | | 30 Hackman Physical Sciences Laboratories | 32 Hartman Green | 48 New College House | | |
| | | 31 Patricia E. Harris Center for Business, Government & Public Policy | 33 Dr. Leon Herman Arts Center | 49 New Street Studio | | |
| | | 32 Hartman Green | | 50 North Museum | | |
| | | 33 Dr. Leon Herman Arts Center | | 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 | | |
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| | | | | 58 Roschel Performing Arts Center | | |
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