

**Friends of Mineralogy
Pennsylvania Chapter
Fall Symposium**

**Pennsylvania
Mining and Mineralogy**

November 2 & 3, 2019

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



Zircon from the Penn/MD Materials quarry, 1 mm.
Ron Sloto photograph; see page 12.

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 2 & 3, 2019

SCHEDULE of EVENTS Listings in **BOLD TYPE** are in LSP Building Auditorium LSP 142.
Others are in 119 Hackman Building.

Saturday, November 2: SYMPOSIUM		<u>page</u>
8:30 to 9:00 a.m.	Registration in 119 Hackman	
9:00 to 9:15 a.m.	Opening Remarks	
9:15 to 10:00 a.m.	Bill Stephens, PG, Stephens Environmental Amethyst Occurrences in Southeastern Pennsylvania - Classic Locales and Recent Discoveries	5
10:00 to 10:15 a.m.	FM-Pa Members: Chapter Membership Meeting	
10:00 to 10:45 a.m.	also BREAK- Check out the silent auction and visit the dealers.	
10:45 to 11:30 a.m.	Karenne Snow, President, Philadelphia Mineralogical Society Minerals and Their Type Localities	7
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.	Peter Heaney, PhD, Penn State Making the Case for Celestine as the Pennsylvania State Mineral	8
2:15 to 3:00 p.m.	Ryan Mathur, PhD, Juniata University and Robert Jacobi (Consultant) U-Pb Dating of Calcite Veins from Rocks in Pennsylvania; Implications of these Ages	11
3:00 to 3:15 p.m.	BREAK	
3:15 to 4:00 p.m.	Ronald A. Sloto, PG, West Chester University Minerals of the Penn/MD Materials Quarry, Fulton Township, Lancaster County, Pennsylvania	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 to 5:00 p.m.	Chapter Board of Directors meeting	
Sunday, November 3: Daylight Saving Time Ends	FIELD TRIP to Peach Bottom, Lancaster County For Symposium Registrants Only <i>See maps inside back cover</i>	14
9:00 a.m. to 1:00 p.m.	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

Amethyst Occurrences in Southeastern Pennsylvania - Classic Locomes and Recent Discoveries

**Bill Stephens, PG
Stephens Environmental**

Amethyst is one of the well-known gemstones and a birthstone (February) and it's fun to collect. Amethyst occurrences are well known in the US and include classic localities mainly in the Southeastern US that have and continue to produce World Class specimens. Noteworthy locations including Due West, Reel Farm, Diamond Hill Mine, Amherst VA and Jackson Crossroads (JXR), from which extraordinary specimens have been and continue to be found, are known to most serious collectors and museums alike. But Pennsylvania? Perhaps the notoriety of these southern sites has overshadowed less notable, but respectable finds in our state. Classic localities for amethyst in southeastern PA include Upper Providence Township, and a location recently rediscovered in Lancaster County.

All of the amethyst and in general clear and smoky quartz occurrences most commonly are associated with Piedmont schists and gneisses containing fractures in which quartz crystals have crystallized, presumably from Silica-rich low temperature hydrothermal fluids. Habit, host rock types, vein type and complexity vary considerably, and many show signs of active tectonism and/or episodic growth and dissolution features.

A few things these southeastern sites all have in common is that they are far away, and if open to the public not only is it pricey but digging is typically limited to the spoils from mining, unless you are invited to a very expensive machine dig. If only we had a place closer to home.

The Lancaster County site rediscovered by Tom Pankratz of the Delaware Mineralogical Society has been fun and productive, but mostly surface collecting until last fall when the top of a weathered in-place vein was discovered. Crystals vary in size and color but tend to be stubby with pitted surfaces, and vary from clear to nearly opaque smoky purple in color. According to Tom Pankratz, the dark crystals respond favorably to heat treatment, and he has faceted one gem so far. So, sit back and enjoy the slides and video!

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.

Minerals and Their Type Localities

Karenne Snow, BA
President, Philadelphia Mineralogical Society

'Mineralogy as science' followed 'minerals as collectibles' in this historical overview of the progress toward a modern study of minerals, leading to the formation of the International Mineralogical Association in 1958.

The mission of the IMA is to manage the naming of minerals, oversee mineral classification, stress the importance of preserving mineral collections and make mineral descriptions and scientific data available in a systematic way.

Mineralogy is the study of the formation, properties and uses of minerals. Minerals are defined as naturally occurring, inorganic building block of rocks, characterized by particular chemical composition and definite crystal structure. At the time of this writing, there are 5208 minerals in the IMA database.

A type locality of a mineral, then, is the site from which the original material came for the formal definition of the mineral species. Type specimens, the reference sample by which the mineral is defined, is required to be deposited in a professionally curated museum.

The Mineralogical Database (mindat.org) lists the valid mineral species found in each state and the type minerals for each state. For example, Pennsylvania has 379 valid species of which 11 are type minerals. The discovery, naming, and localities of these minerals is of interest to the mineral collector who specializes in type locality species.

A photo survey of mineral type specimens held at the Academy of Natural Sciences and photos plus specimens of the type specimens found in Pennsylvania, New Jersey, and New York completes the program.

Making the Case for Celestine as the Pennsylvania State Mineral

**Peter J. Heaney, PhD
Department of Geosciences
Pennsylvania State University**

Since the 1990s, efforts to promote the mineral celestine (SrSO_4) as Pennsylvania's State Mineral have resulted in at least three bills introduced in the state capital, but none have successfully cleared the hurdles for confirmation. At the urging of the Che-Hanna Rock and Mineral Club, Rep. Tina Pickett spearheaded House Bill (HB) 278 in 2017, but it never received even a committee vote. A competitive attempt in 2017 to name quartz as Pennsylvania State Mineral was offered as Senate Bill 610 by Sen. Tom Killion, but it too never came up for a vote. In the summer of 2019, Rep. Pickett added the celestine proposal as an amendment to HB 1282, which advocates for the selection of amethyst as State Gem.

I became involved in this process in 2012 at the behest of Royce Black, who at the time was a sixth grade student at Commonwealth Connections Academy. Royce announced that he was "on a journey to get celestine named as the Pennsylvania State Mineral," and wondered whether I would assist him with "the 'lobbying' step." That ultimately led to a hearing before a legislative subcommittee and a continuing push to discover both the historical and geological background of Pennsylvania's celestine deposits. In April 2019, I met with Dr. Klaus Thalheim, curator of mineralogy in the Senckenberg Natural History Collections of Dresden, to explore the archives regarding Andreas Gotthelf Schütz, the German natural philosopher who discovered celestine in ~1790 near Bellwood, PA and who returned with samples that were analyzed by the premier chemist of the age, Martin Klaproth. With the assistance of Drs. RT Schmitt and A. Massanek, Dr. Thalheim has located the original samples in the natural history museums of Dresden, Berlin, and Freiberg (Figs. 1 and 2). For this talk, I will describe what we have learned about the early identification of celestine, and I will contend that this historical context merits celestine's designation as State Mineral.

Biography

Peter Heaney has been a professor of mineral sciences at Penn State University since 1998. He received his Ph.D. from Johns Hopkins in 1989. In 2008 he served as President of the Mineralogical Society of America (MSA), and for the past four years he has helped organize the celebration of MSA's centennial in 2019.



Fig. 1 - Sample of fibrous Celestine from the Martin Heinrich Klaproth collection purchased by the Berlin Museum of Natural History in 1817. (Courtesy of Ralf Thomas Schmitt, BMNH).

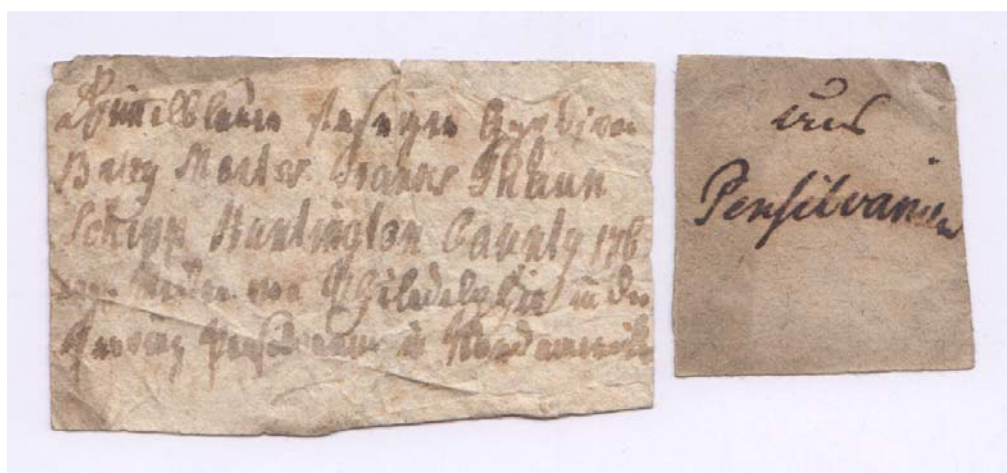


Fig. 2 - Label accompanying celestine from "Baley Moutains" in "Franks Township", likely penned by Andreas Gotthelf Schütz. (Courtesy of Ralf Thomas Schmitt, BMNH).

U-Pb dating of calcite veins from rocks in PA; implications of these ages

Ryan Mathur, PhD

Juniata College

and

Robert Jacobi, PhD

Consultant

The timing of fluid flow through fractured rocks has significant implications for the overall geologic history of an area. To constrain timing of fluid flow through fractured rocks in PA, we present U-Pb dates from calcite veins at various locations. A bulk of the work has centered on age dates within the Marcellus to provide insight to fluid migration and potentially natural gas generation within northern Western Virginia and western Pennsylvania. Preliminary results show that there are at least 3 ages of calcite deposition that could be related to natural gas generation and migration at about 370, 320 and 215MA. The range ages support several different hypotheses about fluid and potentially natural gas migration. A significantly younger set of Cenozoic (28-35MA) were discovered in similar ages rocks and could be related to lower crustal/mantle dynamics or impact induced fluid flow. These data permit clearer timing relationships to important aspects of the geological history of Pennsylvania.

Minerals of the Penn/MD Materials Quarry, Fulton Township, Lancaster County, Pennsylvania

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

The Penn/MD Materials quarry is located on the Mason-Dixon Line in Fulton Township, near Peach Bottom, Lancaster County, Pennsylvania. In 2019, the quarry expanded across the Pennsylvania state line into Maryland. The quarry, owned and operated by the H&K Group, produces aggregate from ultramafic rocks of the Baltimore Mafic Complex, known locally as the State Line Serpentinite District. This complex of ultramafic and associated gabbroic rocks is believed to be a remnant from the roots of an island arc complex formed at about 490 to 510 million years ago above a southeast-dipping subduction zone. This zone incorporated detritus from the margin of the Laurentian continent and nearby microcontinents, as well as ultramafic oceanic material from the floor of the Iapetus.

The Penn/MD Materials quarry is one of two active serpentinite quarries in Pennsylvania and the only one open to mineral collectors. The author is developing a list of mineral species occurring at the quarry. Minerals are identified and confirmed using an environmental scanning electron microscope integrated with an X-ray energy dispersive spectrometer (SEM/EDS) and/or a powder X-ray diffractometer (XRD) at the West Chester University Center for Microanalysis and Imaging, Research and Training. Mineral species identified to date include albite, antigorite, brucite, chromite, clinocllore, desautelsite, dolomite, magnesite, hydromagnesite, magnesioferrite-magnetite series, monazite-Ce, nakauriite, nickeloan pyroaurite, pyroaurite, quartz, serpentine subgroup, talc, and zircon.

Biography

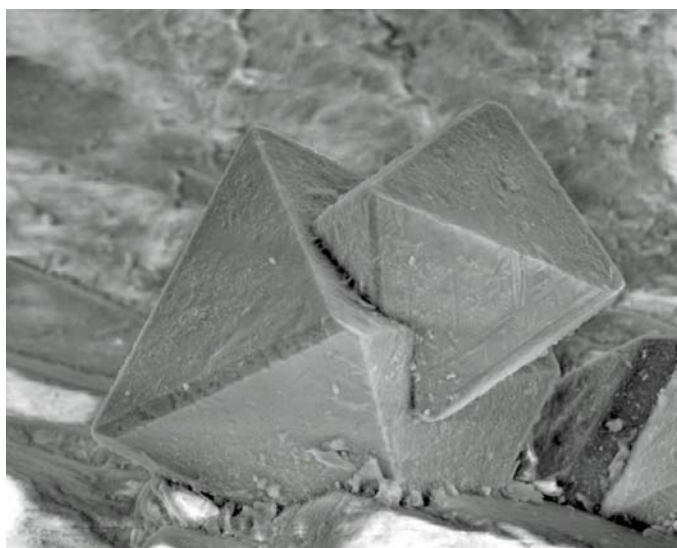
Ron Sloto is on the research faculty of West Chester University, and he is the curator for the mineral collection at the University. He conducts research on the chemical composition of minerals of southeastern Pennsylvania. Ron Sloto retired from the U.S. Geological Survey in January 2015 after a 41-year 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”), Berks County (“The Mines and Minerals of Berks County, Pennsylvania”), and Montgomery County (“The Mines and Minerals of Montgomery County, Pennsylvania”). He is a frequent contributor to the Friends of Mineralogy Pennsylvania Chapter and National newsletters.



Zircon from the Penn/MD Materials quarry, 1 mm.



Nickeloan pyroaurite on hydromagnesite from the Penn/MD Materials quarry, magnified.

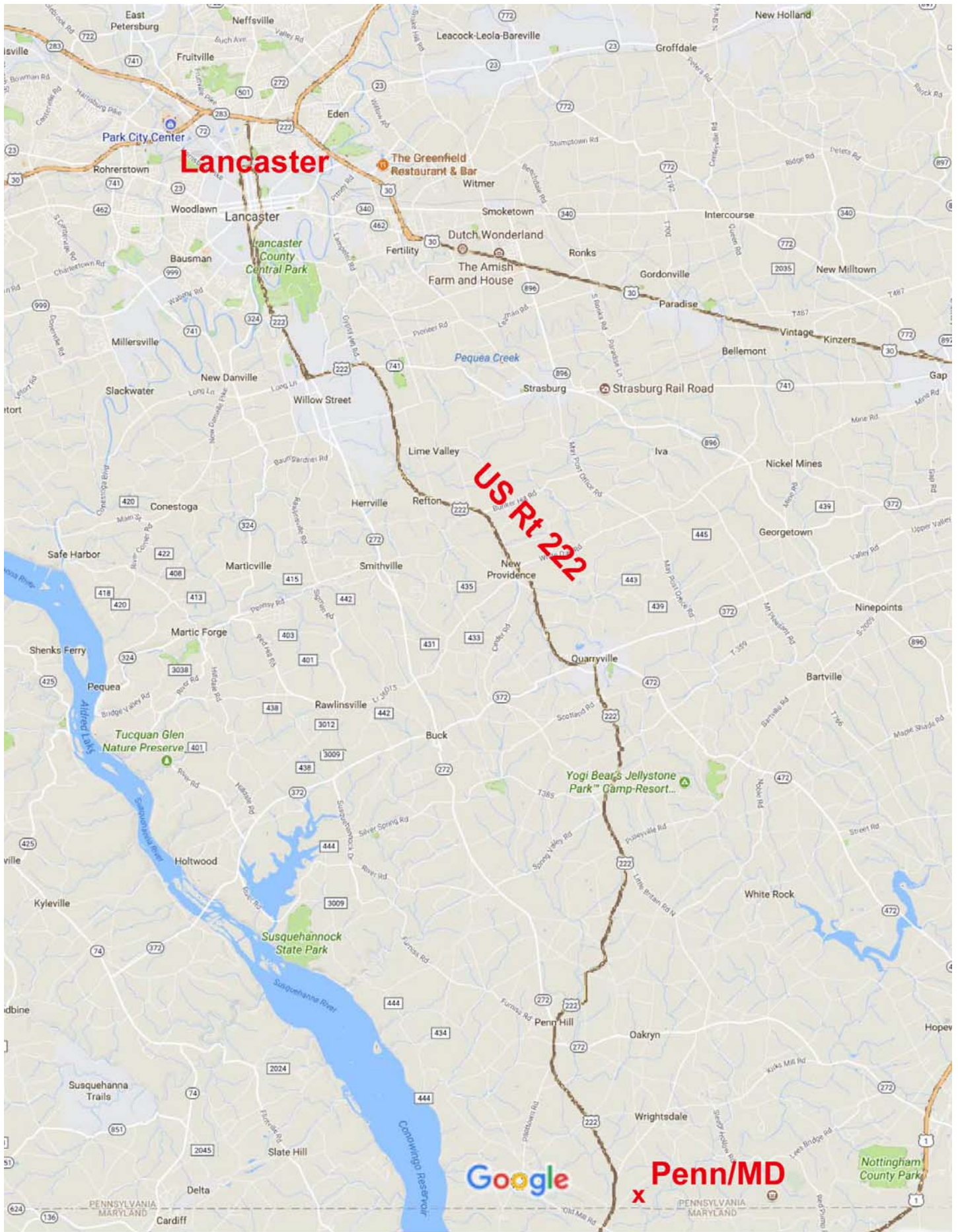


Scanning electron microscope image of magnesioferrite-magnetite series crystals from the Penn/MD Materials quarry.



Scanning electron microscope image of dolomite crystals from the Penn/MD Materials quarry.

Photographs on this page by Ron Sloto.



H&K Penn / MD Materials Quarry

US Rt 322 Lancaster -->

Quarry Rd

Robert Fulton Hwy

Pennsylvania
Maryland

Mason Dixon Rd

Rock Springs Rd

Google Earth

© 2018 Google

Imagery Date: 2/26/2018

39°43'26.34" N 76°09'18.81" W elev 442 ft eye alt 4369 ft

1932

ENTER HERE

**Registration, dealers,
silent auction,
refreshments,
give-aways**
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|---|---|----|--|----|--|----|---|----|--|----|---|
| 1 | Lisa Bonchek Adams Auditorium in Kaufman Hall | 10 | Bonchek College House | 21 | Distler House/Campus Bookstore | 34 | Huegel Alumni House | 46 | Multicultural Affairs, 625 College Avenue | 62 | Stager Hall |
| 2 | Admission, Wohlsen House, 637 College Avenue | 11 | Brooks College House | 22 | Facilities Services, 415 Harrisburg Avenue | 35 | Huegel Alumni House Annex, 445 College Avenue | 47 | The President's House, 508 North School Lane | 63 | Stahr Auditorium |
| 3 | Alumni Sports & Fitness Center, 929 Harrisburg Avenue | 12 | Brooks Tennis Center | 23 | Faculty, Ementi Faculty & Foreign Language Tutor | 36 | International House, 446-448 West James Street | 48 | New College House | 64 | Steinman College Center |
| 4 | Appel Infirmary Asian Cultural Center, see Multicultural Affairs | 13 | Buchanan House | 24 | Offices, 717 College Avenue | 37 | James Street Apartments, 534 West James Street | 49 | New Street Studio | 65 | Sustainability House, 550-52 West James Street |
| 5 | Arts House, 602 West James Street | 14 | Business Office, 644-646 Race Avenue | 25 | Financial Aid, 617 College Avenue | 38 | Jazzman's Cafe & Bakery | 50 | New Museum | 66 | Thomas Residence Hall |
| 6 | Baker Campus, 1300 block of Harrisburg Pike | 15 | Career Services, 619 College Avenue | 26 | Franklin-Meyran Hall | 39 | Joseph International Center, 701 College Avenue | 51 | Office of Student Academic Affairs, 623 College Avenue | 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 | 27 | French House, 548 West James Street | 40 | Kaufman Hall, see Lisa Bonchek Adams Auditorium in Kaufman Hall | 52 | Old Main | 68 | Ware College House |
| 8 | Ann & Richard Barshinger Life Sciences & Philosophy Building | 17 | College Guest House, see Huegel Alumni House Annex | 28 | Gernhart House | 41 | Keiper Liberal Arts | 53 | Other Room Theatre | 69 | Weis College House |
| 9 | Black Cultural Center, 615 College Avenue | 18 | College Row | 29 | Goethean Hall | 42 | Kleier Center for Jewish Life, 645 College Avenue | 54 | Philadelphia Alumni Writers House, 633 College Avenue | 70 | Carolyn W. & Robert S. Wohlsen Center for the Sustainable Environment |
| | | 19 | Counseling Center, see Appel Infirmary | 30 | Green Room Theatre | 43 | Kunkel Aquatic Center, 929 Harrisburg Avenue | 55 | Phillips Museum of Art | | Writers House, see Philadelphia Alumni Writers House |
| | | 20 | Diagnothian Hall | 31 | Hackman Physical Sciences Laboratories | 44 | Marketplace Dining Hall | 56 | POGIL, 713 College Avenue | | |
| | | | Dietz Hall | 32 | Patricia E. Harris Center for Business, Government & Public Policy | 45 | Martin Library of the Sciences | 57 | Public Safety | | |
| | | | | 33 | Dr. Leon Herman Arts Center | | Mayer Physical Education Center | 58 | Roschel Performing Arts Center | | |
| | | | | | | | Meyran Hall, see Franklin-Meyran Hall | 59 | Schnader Residence Hall | | |
| | | | | | | | | 60 | Shadek-Fackenthal Library | | |
| | | | | | | | | 61 | Sponaugle-Williamson Field | | |