

Micromineralogy in the 79

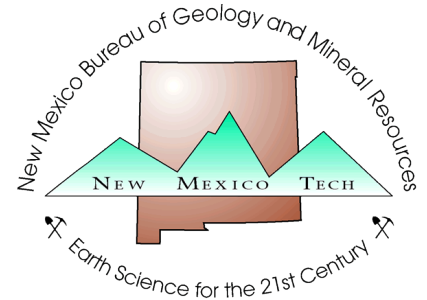
Ron Gibbs

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The annual [New Mexico Mineral Symposium](#) provides a forum for both professionals and amateurs interested in mineralogy. The meeting allows all to share their cumulative knowledge of mineral occurrences and provides stimulus for mineralogical studies and new mineral discoveries. In addition, the informal atmosphere encourages intimate discussions among all interested in mineralogy and associated fields.

The symposium is organized each year by the [Mineral Museum](#) at the [New Mexico Bureau of Geology & Mineral Resources](#).



Abstracts from all prior symposiums are also available: <https://geoinfo.nmt.edu/museum/minsymp/abstracts>

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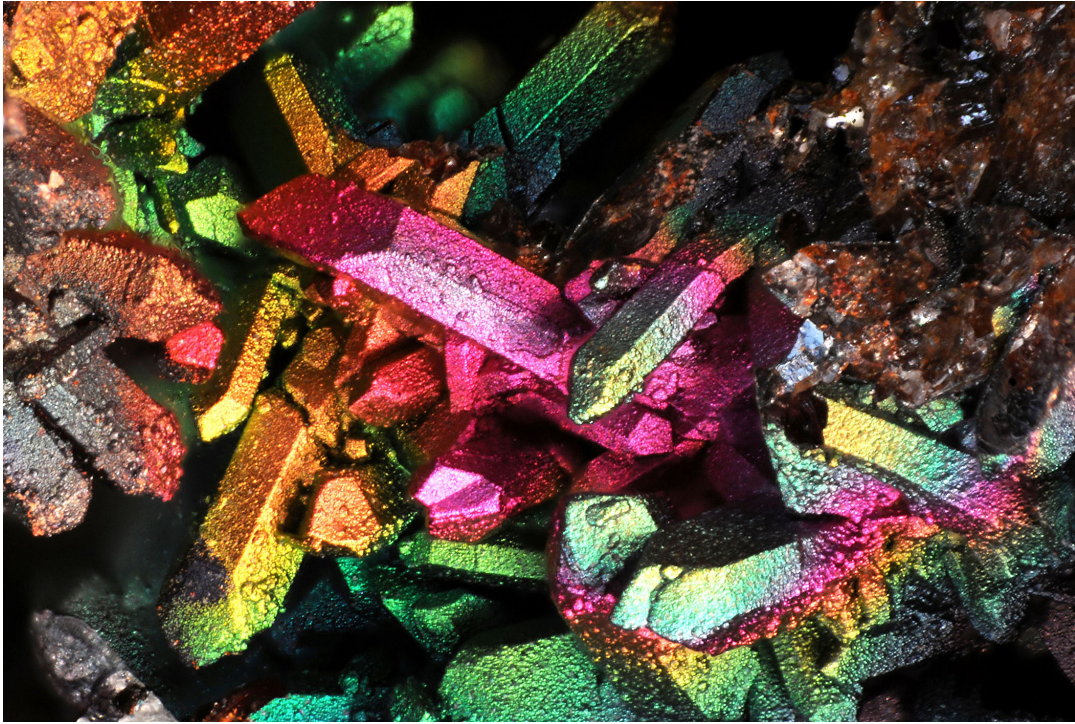


Aurichalcite on wulfenite with hemimorphite, 8 mm field of view, from the 79 Mine, Arizona.

The 79 Mine has produced some of Arizona's best specimens of several species and is well known worldwide for the beautiful minerals it has produced. The mine is currently under private ownership and collecting for specimens continues.

The mine is located in the Dripping Spring Mountains about two hours northwest of Tucson. Other famous localities are close by; the Christmas mine and the Ray mine. Claims were originally staked in 1879 but serious work did not begin until 1919. The Seventy-Nine Mining Company began operations with a 50 ton/day mill but their operations ceased after a few years. Ownership squabbles led to reorganization and the Seventy-Nine Lead-Copper Company began operating in 1928. They operated until 1930, shipped over 2,500 tons of oxidized lead ore and were ranked as Arizona's 5th largest lead producer. Limited mining resumed with a new concentrator from 1936 until 1938 but then closed due to low commodity prices. Production resumed in 1940 by the Shattuck-Denn Mining Corporation which began mining sulfides and extended mine development down to the 7th level. Production ceased in 1949 and little production has occurred since as the mine went through ownership changes and several leasors. More recently, the mine has been operated for specimens by several individuals and groups.

Oreboodies in the mine are found within Pennsylvanian shales and limestones of the Naco formation which rest unconformably upon the Escabrosa limestone of Mississippian age. Rhyolite dikes intruded these rocks in the early Tertiary producing garnetized skarns. Mineralizing solutions emplaced sulfide minerals in favorable sediments along dike margins, in brecciated rocks and in fractures and faults. The oreboodies were formed as bedded and vein replacement. Regional uplift and erosion exposed the rocks to weathering producing the oxide minerals so eagerly sought by the mineral collector.



Iridescent hematite, 7mm field of view, from the 79 Mine, Arizona.

The 79 Mine is well known for the outstanding specimens of aurichalcite, hemimorphite, smithsonite and wulfenite that have been collected over many years. High quality miniatures and cabinet specimens grace many private and public collections. Wendell Wilson reported a major find of world-class aurichalcite in 1972. George Stevens, George Brunel, Mitch Dale, and Malcolm Alder collected exceptional specimens of botroidal green (cuprian) smithsonite from the lower 4th level or “chrysocolla room” in the 1990s. In the early 2000s, George Godas and John Callahan were able to extend further into the aurichalcite zone and recover additional specimens. They also pursued the lower 4th level smithsonite zone further, recovering additional cuprian smithsonite. Godas and Callahan collected hemimorphite from several mine locations and some very nice wulfenite specimens from the 4th level wulfenite stope. These crystals are hard to collect due to their fragility and the hard matrix they are attached to.

There is also a larger suite of minerals that although are smaller in stature are just as beautiful. These microminerals include species that seldom form large crystals, some that are rare, and some more common ones that exhibit a wide diversity of habits and colors. This presentation will highlight many of these “overlooked” minerals to portray the wider mineral diversity found in the 79 Mine.

The following list of minerals known to occur at the 79 Mine comes from many sources but doubtful occurrences and ill-defined minerals with duplicate names have been omitted. Some reported minerals have not been encountered by the author or recent collectors. Several species were encountered in the lower levels of the mine, the 5th, 6th, and 7th levels. However, these levels have been inaccessible for several years and these occurrences cannot be verified.

Reported minerals from the 79 Mine			
Acanthite	Cuprite	Linarite	Scheelite
Andradite	Descloizite	Magnetite	Scorodite
Anglesite	Diopside	Malachite	Siderite
Antlerite	Diopside	Manganite	Silver
Aurichalcite	Dolomite	Melanterite	Smithsonite
Austenite	Epidote	Mimetite	Sphalerite
Azurite	Fornacite	Molybdenite	Stolzite
Beaverite-Cu	Galena	Montmorillonite	Sulphur
Brochantite	Goethite	Mottramite	Tenorite
Calcite	Gypsum	Murdochite	Tetrahedrite
Caledonite	Halite	Muscovite	Tremolite
Celestine	Halotrichite	Olivenite	Tsumebite
Cerussite	Hematit	Osarizawaite	Vanadinite
Chalcanthite	Hemimorphite	Phosphohedyphane	Phosphohedyphane
Chalcoalumite	Heterolite	Plattnerite	Willemite
Chalcocite	Hollandite	Plumbojarosite	Wulfenite
Chalcopyrite	Hydrozincite	Psilomelane	Zoisite
Chlorargyrite	Jarosite	Pyrite	
Chrysocolla	Kaolinite	Pyrolusite	
Clinoclase	Ktenasite	Pyromorphite	
Clinozoisite	Kuksite	Quartz	
Copper	Lepidocrocite	Ramsbeckite	
Corkite	Libethenite	Rosasite	
Covellite	Limonite	Sauconite	

References:

- Mineralogy and Paragenesis of the 79 Mine Lead-Zinc-Copper Deposit, Stanley Keith, Mineralogical Record, 1972, Vol.3, No.6.
- Folio: the 79 Mine, Wendell Wilson, Mineralogical Record, 1972, Vol.3, No.6.
- Arizona Zinc and Lead Deposits, Arizona Bureau of Mines, Geological Series 19, Bulletin No. 158, Part II, 1951.