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The Peace River Meteorite



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May

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Meteorite Times Magazine

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Meteorite Times Magazine

Disturbing the Peace River Meteorite

Martin Horejsi



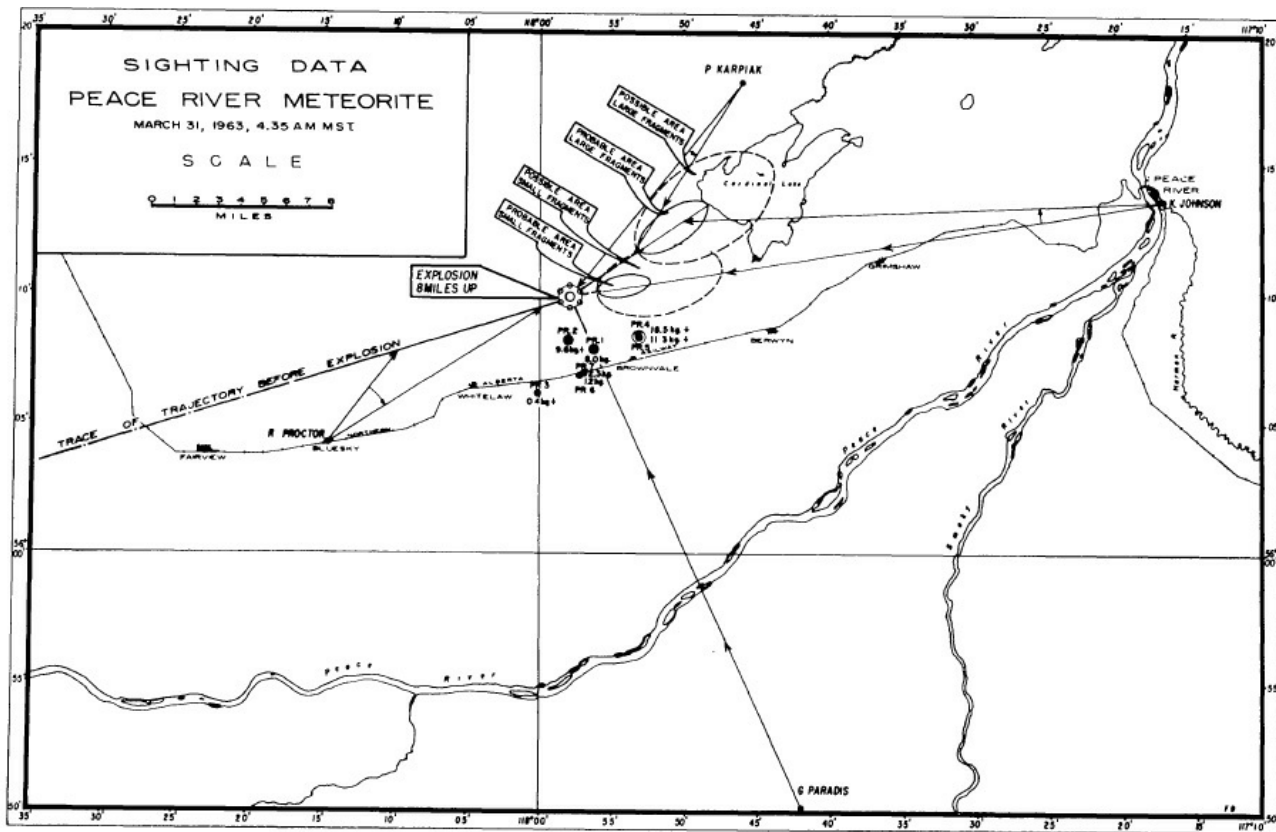
The seven gram specimen of Peace River, Canada in the author's collection.

“Then came a flash so brilliant that you could not see anything and it lit up everything bright as day. Then came the explosion after the light faded out, which shook the house with such force that the windows and dishes rattled.”

-Emil Grigoleit of Hines Creek, Alberta, Canada.

There are many shocking things about the fall of the Peace River meteorite including just how many witnesses were awake at 4:35 AM on a cold Sunday morning. Mr. Grigoleit's account quoted above is one of dozens that when combined shrank the witnessed fall area from 4000 square miles to about 100 square miles. From there, the elliptical strewn field was further refined resulting in a quite manageable 5.5 by 3.5 mile search area.

So less than a month after the March 31 fall, and after the snow melted, the first piece of the Peace River meteorite was found, an 8kg fragment that John Westgate pulled from a field a mere two days into the serious search after the snow melted and the floodwaters subsided. A total of seven pieces of Peace River were reported found weighing from 360 grams to 16.6 kilos for a total recovered weight of over 45 kilograms. There were also many so-called *souvenir* specimens collected but not recorded or weighed.



The early stages in the search for the Peace River meteorite began with mapping the stories from witnesses.

Solid fieldwork led to the location of the Peace River fragments now in captivity, but the first hurdle in the science of the Peace River meteorite was convincing those in academia that such an event actually took place and was worthy of the 300 mile drive. But like L'Aigle, the eyewitness testimony was consistent and overwhelming making a six-hour one-way trip to the fall area worth the time of university researchers. Arriving on site, the interviews began. In essence, each witness was taken to the exact spot where they were when Peace River fell. The witnesses were given a stick to point at whatever they remember seeing. The directions and angles were recorded and measured using a Brunton compass.



A Brunton Pocket Field Transit compass similar to the type used to triangulate the angles and arcs provided by the many witnesses who just happened to be awake early that Sunday morning.

On a side note here, although many consider Brunton compasses to be from an American company, it was actually D.W. Brunton who commissioned a watchmaker in Denver, Colorado to build Brunton's invention, a Pocket Transit Compass. Brunton himself was a Canadian-born geologist and mining engineer.

Some of the eyewitness testimony collected and documented by R. E. Folinsbee and L. A. Bayrock in their highly detailed account of the fall included:

"...First noticed when ground and interior of car lit up like sheet lighting."

-R.C.M.P. Constable Lowe

Saw an orange fireball the size of several full moons descending at a very steep angle ...exploding... leaving behind a large number of bright fragments that fell to the ground.

-Peace River resident Lloyd Leonard

Heard a low hissing sound.

Shaftsbury Settlement resident Fred St. Germain

Saw the sky brighten and a reddish bolide about one-third the size of a full moon descending.

-Piece River resident Mrs. Ragelson

Saw a flash in the sky and then a yellow to reddish fireball about one-tenth the size of the full moon at the same time he heard a sound rumbling sound.

-Bluesky resident R. Proctor

Saw the whole sky brighten up and a fireball of very deep red color about "one foot" in diameter.

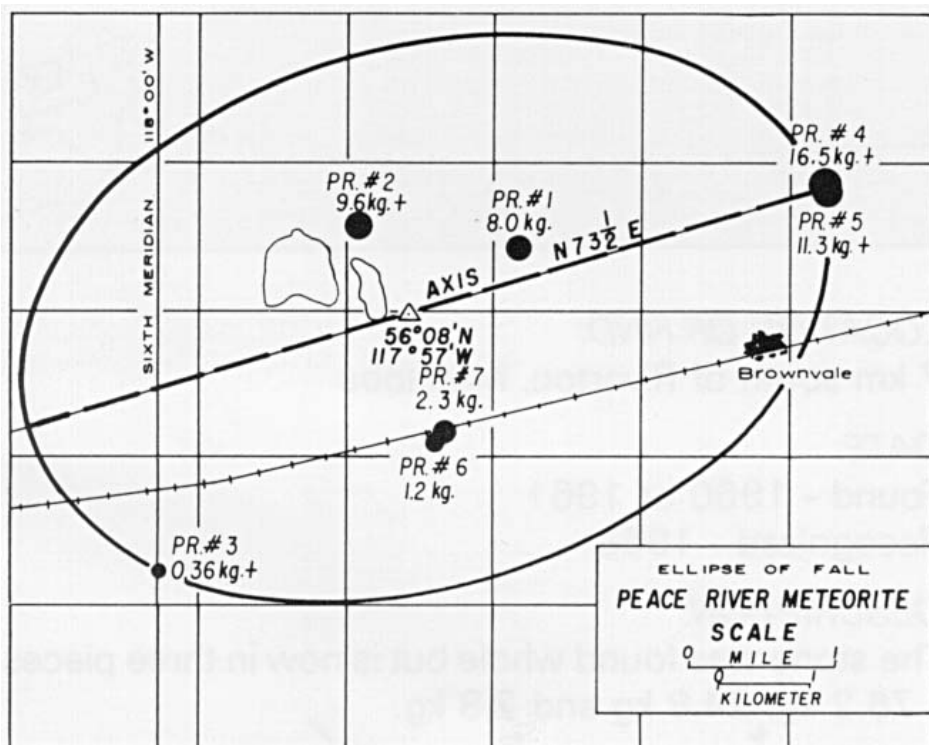
-Warrensville resident Peter Karpiak

Saw a bolide travel across path of his car west to east. The bolide was small at first and became larger and larger until at least the size of the full moon at which time it exploded. Noted that the explosion took place 15-20 miles away.

-Smithmills resident V. Lambert (whose observation was remarkably accurate)

And on and on.

Once the general area of the fall was identified, a Cessna 180 airplane was used to search for fragments. However the snow cover prevented finding anything. A ground search at that time was equally ineffective. And as anyone around farmland knows, when the snow melts, the fields flood. So although a mild search proceeded with searchers wearing wading boots it too was unfruitful. Even worse, chert pebbles are a common rock in the area and they look remarkably like meteorites and were collected in droves. And finally, adding insult to injury or rather the other way around, the day before the first fragment was found it was reported that "all our searchers acquired was a severe sunburn."



(Courtesy of Dr. R. E. Folinsbee)

Folinsbee's map of the location within the strewn field of the recovered fragments of the Peace River meteorite.

Much was learned back when Folinsbee searched the Bruderhiem, Canada fall in 1960 ([discussed here in the Accretion Desk back in 2011](#)). So building on that knowledge and lessons-learned including the fact that even large meteorite fragments can be easily overlooked in a cultivated field unless a highly systematic search is undertaken.



R. E. Folinsbee holding a large fragment of the Peace River meteorite.

One particular fragment was most interesting not because it was a meteorite but rather because it was not a “*meeteorite*” (this author’s choice of spelling). Its thought a coyote was disappointed the stone was not a sharp-tailed grouse or other tasty beast. In disgust after sneaking up on the rock, the canine defecated on the fragment. That story reminds me of the dog that urinated on a piece of Lost City before it was recovered. Perhaps there is a new collecting genre for such localities similar to “Hammer Stones.” If such a category is opened, may I suggest the name “*Meteortoilite*.”

Three followup searches were made, one each in June, July, and August of the same year. Folinsbee and Bayrock outlined two facts about the functional search for Peace River meteorite specimens including:

-Its possible to accurately “Pinpoint” a fall area even when the closest witness is 20 miles away.

-A systematic reporting system is necessary to collect the diversity of witness information. Also use the media and “on-the-spot education in meteoritics.” (in the article Nininger was given a nod for that tip)

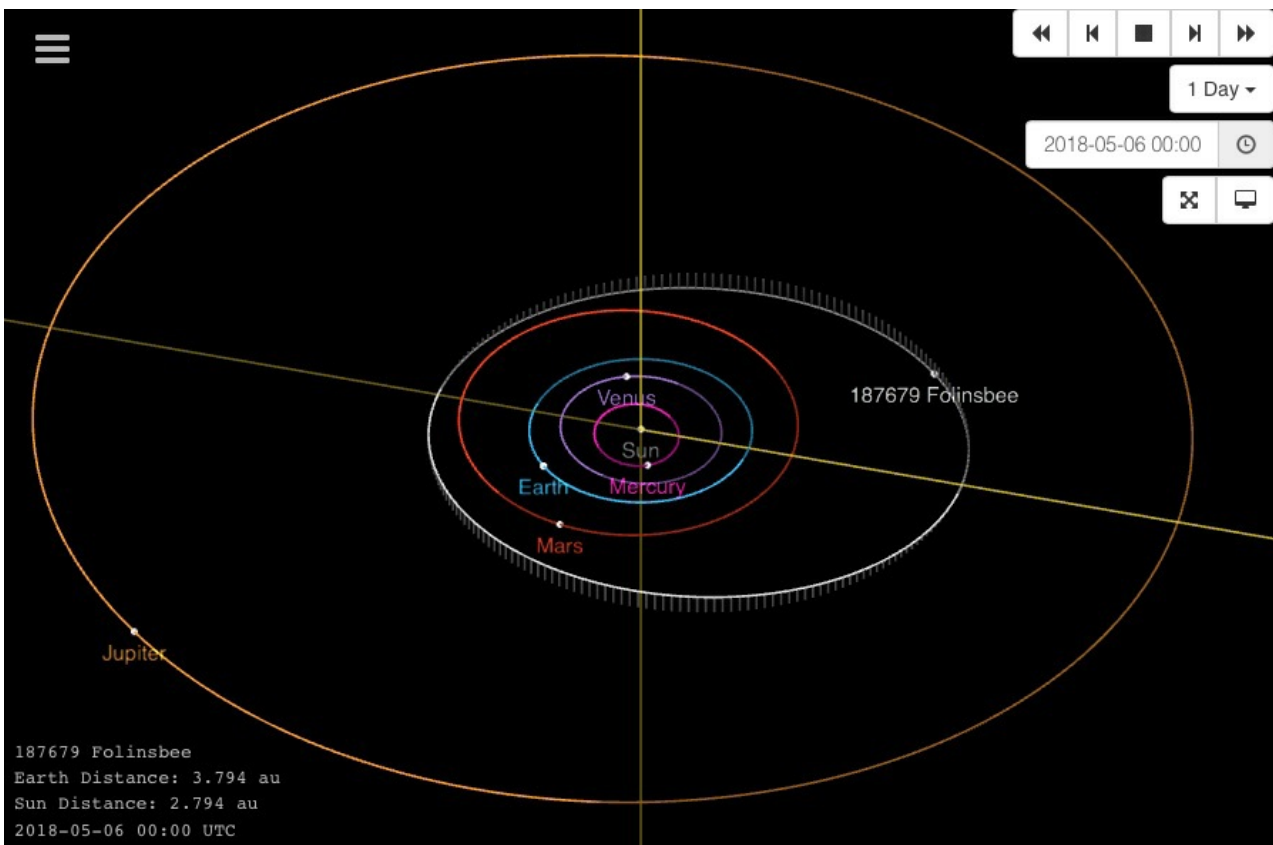


In the end, R. E. Folinsbee reported to the Meteoritical Bulletin (No. 27, July 1963) about the Peace River meteorite fall with a total weight of recovered specimens of 45.76kg. Although the above fall information is clearly listed in the [Meteoritical Bulletin Database](#), the official Peace River entry lists a total known weight of only 8kg.



One of the many dark colored inclusions within the grey matrix of Peace River. Notice the interesting seam running diagonally.

Robert Folinsbee died in 2008, but his rich scientific career lives on as does his memory with asteroid (187679) Folinsbee named in his honor.



The location of asteroid (187679) Folinsbee at the time of this writing.

Like all witnessed meteorite falls Peace River is filled with excitement and chase. But dare I call Peace River historic? Well, considering that it fell in the year I was born, I'd say Peace River, while a wonderful and highly collectable L6 chondrite with a rich documented history, it is far from historical.

Until next time...

Meteorite Times Magazine

Mysteries Solved at the Saw

James Tobin

It has been exciting several months. I have done a great amount of meteorite cutting for our business and a couple friends. I have been finding as I cut that what the friends thought they had was not always what I found at the saw. The most enjoyable of these fortunate mistakes was a batch of stones that were supposed to be carbonaceous chondrite and seemed to not be. I made several cuts into the first stone and it was weird material. I put a rare earth magnet on the stone and it slid off. There was no visible metal and from the reaction of the magnet, there was not any iron response from the mineral portion either. There were some chondrules and the stone was brecciated. I knew it was not carbonaceous but what I was thinking it might be required me to go to my office and look at the met bulletin and do some other research.

I have cut a few R chondrites over the years. It is usually one stone or maybe two but never very much and they have always been something already classified. To be honest my first-hand knowledge of R chondrite identification was a little lacking. I remember reading about them in books but had to check the characteristics I was seeing at the rock saw to confirm if my guess of R type chondrite was even possible. The no visible metal and low metal in the mineral portion were things I knew about R chondrites. When I found that almost 50 percent of R chondrites were breccias which was another important fact. I continued the research with looking at all the images I could find and several were quite similar to what was on the saw.

I messaged Jason Phillips who owned the stones and let him know what I was guessing. I did not want to cut more of the stone in the normal size and thickness slices if it was an R chondrite. It might make them too expensive at \$25 per gram for people to afford and I would have to rework them smaller. He agreed and asked me to prepare a piece to send directly to a lab for classification. I smoothed up a slice just over 25 grams. It was nicely brecciated and would work well for classification. I put it in the mail with a letter explaining the circumstances of my discovery and what I guessed.



I packaged up the slices I had cut after finishing the lapping and polishing. I sent the material back to Jason

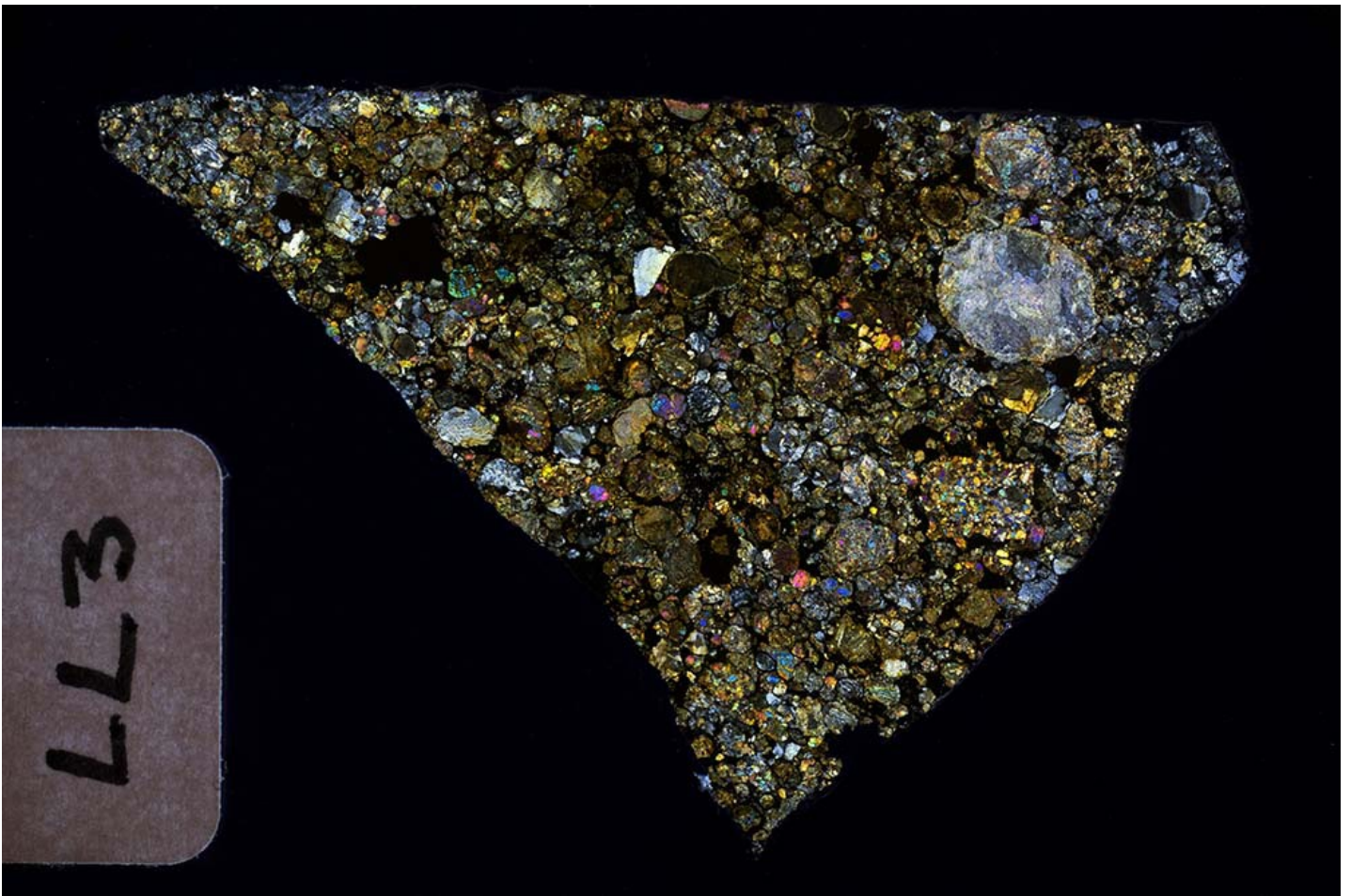
and we waited to hear what the scientific world would say. We did not have to wait long. Within just several days the type specimen had gone through a preliminary examination and it was looking like an R3. This was pretty exciting news. I love being in on the ground floor of meteorite classification. It was going to take a while for thin section preparation and the rest of the research to be done to verify the initial R3 identification. Actually, about 6 weeks to just get the thin section made. Had I known it was that long a wait I could have made one and sent it along with the type specimen.

One learns to be patient when waiting for meteorites. It seems at every level meteorites require us to relax and wait. Some take a long time to cut successfully. They take their sweet time in arriving at Earth and they require patience and persistence to find in the field. But waiting for classification is waiting that is out of my control and I have more trouble with that when the specimen is something exciting. I got an occasional email as Jason checked with his scientist on the progress. Then the day came that we heard that the meteorite was approved and in the Meteorite Bulletin Database. I was so convinced by the time that I sent the type specimen off for classification that it was an R3 that Paul and I had bought a bunch of it for the business. I was at Paul's home for a weekend of astrophotography when we got the news from Jason that the meteorite was officially approved. NWA 11721 was the newest R3 chondrite. I have to admit that I was also relieved a little that the purchase we had made without know for sure was going to be what I had guessed and not something of much less value.

About the same time that I was cutting the R3 chondrite I was cutting the end off another stone that was rather ordinary in appearance on the outside. But as it turned out it was "ordinary" in the same way Ordinary Chondrites are ordinary; fascinating and unique. It was special and very cool. It was densely packed with very visible chondrules that looked to be in great shape. I will warn you that as of this writing this meteorite is still in the process of being classified and is not official yet. But from the very start I was told it was likely an LL3. I am still waiting to see if that turns out to be true. I have a few meteorites at this point in my life but very few of them are striking type 3 chondrites with dense pristine chondrules. And my pieces of types like that are not big specimens. As soon as I saw the stone after the first cut I knew it needed to go off for classification. Within a few days I decided to see if I could buy the stone, which I did. I took two slices off the side of the mass. One was to keep as a beautiful addition to my Riker box collection the other was to become the type specimen and to make thin sections from. Of course I finished preparing the main mass also. I prepped the piece going off for classification. I sliced up the other portion so I had seven wafers of nice size for thin sections. I mounted them after lapping and polishing the glued side. The thin sections came out very nice. All were good but one was especially even and flat. As it turned out I made three of them thinner and four not quite as thin. I would later thin three of those down too. But unfortunately one would never get that final thinning. I posted some images of the meteorite on Facebook and got an email very quickly from Dr. Hutson at Cascadia Meteorite Laboratory that she thought it was a perfect candidate for some research that they are doing on clustered chondrules. I was thrilled to send them the type specimen and offered them that thin section which was especially nice to do the classification work from. She had asked me where I got my thin sections and I had told her I make them myself. They were looking for another source. I gave her a few names of companies we have used over the years. I said "If the thin section is not good enough for your use that is OK just keep it, maybe it will be good for the optical microscope work at least if not the microprobe work."

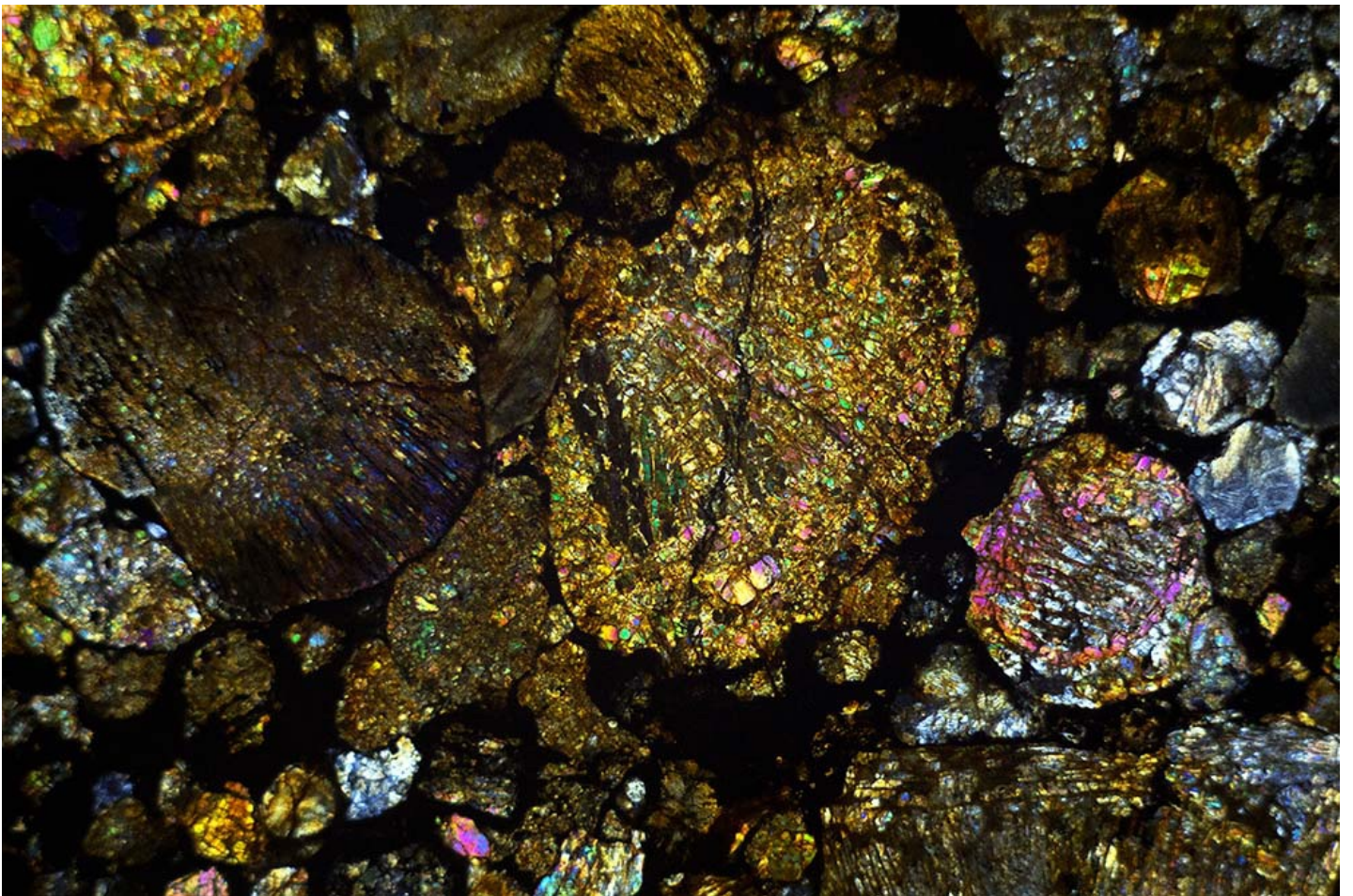
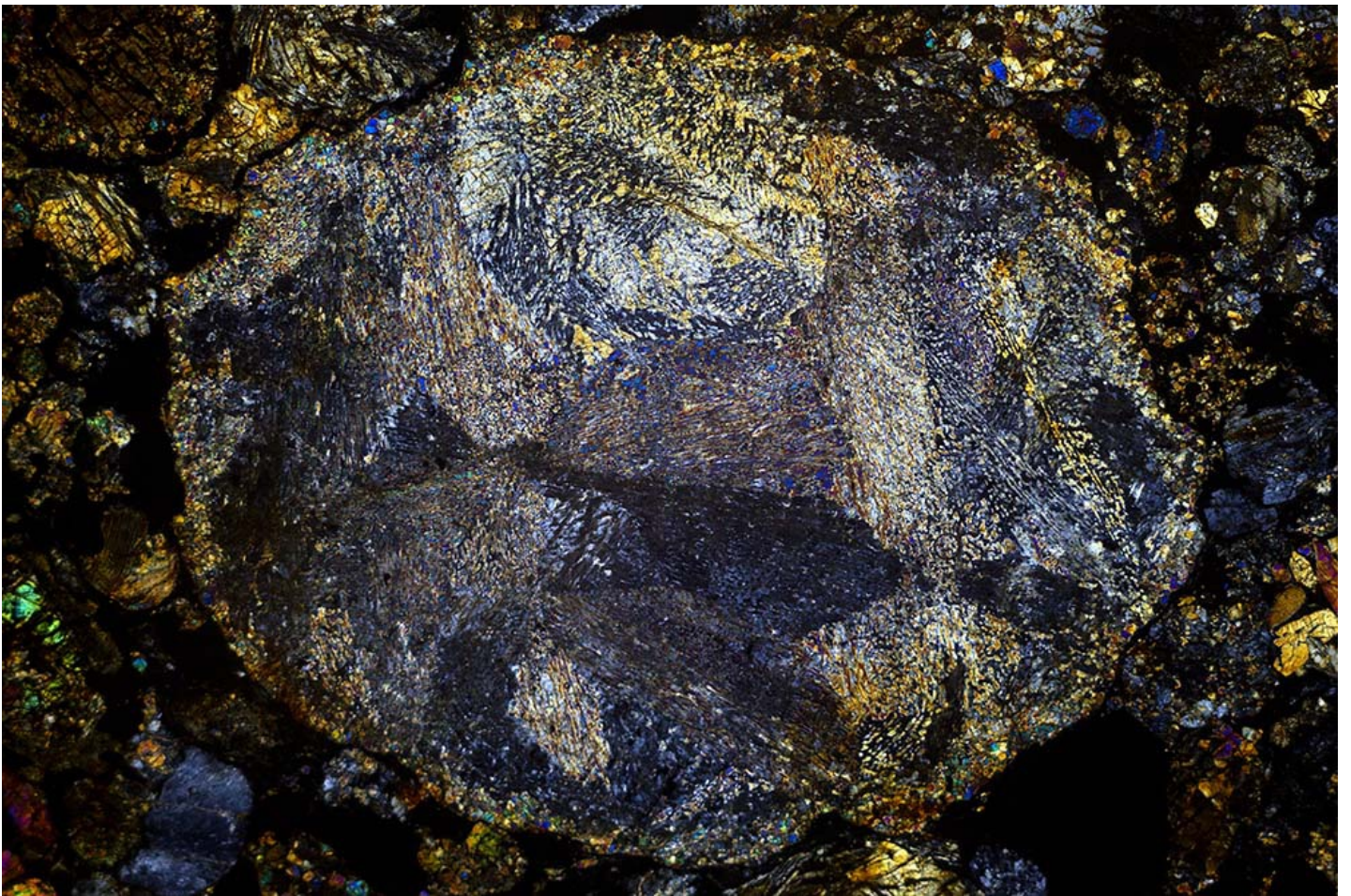


I packaged up the type specimen and thin section and off they went. I heard in a few days that they were there and that the meteorite had plenty of chondrule clusters and might be fine for the research. That was really exciting for me. I have never had one of my discoveries used in a research project. Also, the thin section was good enough for them to work from. They would have to repolish it with colloidal silica for the microprobe but otherwise, it was OK. That was also exciting. I had not until recently felt my thin sections were close enough to 30 microns to be used in a laboratory setting but the ones I have made in the last year or so are really close. And the older ones I have reworked thinner most of them are also very close now.



The meteorite was immediately guessed from my Facebook photos to be a type LL3. The fact that the matrix of the meteorite was nearly all FeS was regarded as further evidence of it being an LL3. The chondrules are surrounded by the distinct bronze colored mineral and the space between chondrule when there is space is filled with it. There really is no fine grain stony matrix in the meteorite. It is just densely packed chondrules and a thin fill of FeS and a little nickel-iron metal.

It is that period of time now when I wait to hear back about the meteorite. I hope that it arrived at Cascadia Meteorite Lab in time to be useful in the research. I hope that my thin section was actually used for the work and that they did not have to have another made. I will feel a little bad if they did for I sent them nothing by way of a donation for the classification work this time since they had sought me out being interested themselves in the stone. I like working with them and they are friendly people I will make it up in the next submission if they went to extra trouble on the meteorite I am still calling the "Maybe LL3."



I did not make any thin sections of the R3. We have slices of it for sale at our sales site and I will put a link in at the end. I think a thin section or two of it will happen in the future when that meteorite comes back to the saw again for more pieces to be made. Rummuruti type meteorites are not very common and type 3 R chondrites are quite scarce. In the Met Bulletin Database, less than 30 are listed as R3. Others are

mixtures of petrological types and recorded in the database as R3-5 or R3-6 many are more specifically defined with a decimal such as R3.8 or R3.9. Sometimes that refined classification can make these stones extra cool. [NWA 11721](#) is described as follows. "Breccia composed of angular clasts in a matrix of related debris. Clasts contain well-formed, separated unequilibrated chondrules (apparent diameter $310\pm 200\ \mu\text{m}$, $N = 15$) set in a finer grained metal-free matrix. Accessory minerals are sodic plagioclase, troilite, Ti-chromite and chlorapatite." It seems to be a true R3 which makes me happy as I love type 3 meteorites of all classifications.

I will refrain from using the Forrest Gump quote and just say that meteorites are mysterious. Their outside appearance is often deceiving. You may think that you have a certain thing only to be surprised after the first cut. It has happened to me many times that I expected a really weathered stone and found it was actually pretty fresh inside or anticipated from the outside another piece of something common in a batch of meteorites from one location only to find that it was not, for example, another NWA 869 but something different mixed into the batch. Provenance is absolutely important but it really only goes so far. And maintaining perfection in inventory control also absolutely necessary. Yet, more than one meteorite lands in a single location over thousands of years. After enough time in the same terrestrial environment, they may weather similarly. It requires attention at the saw to determine if the stone being cut matches all the characteristics of what is supposed to be getting cut. Just because it is in the box marked something does not magically make it that. I would guess that some portion of NWA stones sold as a certain find are not. If they are never cut then no one will ever know for sure. I have a pile of stones from a batch of several hundred NWA 869 that clearly are not NWA 869. They just don't match all the requirements and I have set them aside. We will have to wait until they are cut to learn more and see if they actually are part of that tremendous fall. If they are not and are stones from overlapping strewnfields in the area of NWA 869 or are just other meteorites thrown in the box by the gatherers in the desert, they must be sold as Unclassified NWA stones.

It was a little more common a few years ago to buy big batches of stones, like a crate of Al Haggounia 001 or twenty kilos of NWA 791. Those two are easy to identify, even before cutting. But telling the difference between many of the other old falls not so easy. No one is going to have much of a problem with identifying a Millbillilli stone. They look a certain way, are coated in the orange soil, they are very distinctive. But, that is not the case with old desert finds where the boundaries of the strewnfield are sort of known to the gatherers only and locations are not recorded for the pieces found. To add to the problem the stones pass through many hands before arriving at their final owner.

At gem shows the stones are in boxes sort of graded into price ranges. This seems to be based on their general state of weathering as seen by their exterior. The fresher ones are pulled out and put inside the suites or on tables while the older stones remaining in boxes. I am a lifetime swap meet junkie and have little compunction about just digging into a box of meteorites and combing through it for a treasure missed by others. But over the years thousands of hands lift them, handle them, and then put them back into maybe a different box. After a few years, they are completely mixed. I bought a strange stone a few years ago from such a box. I wrote the story and won't repeat it here. But it turned out to be a beautiful impact melt. I have described it to friends over the years and on two occasions friends have said I have a piece of something just like that. And I am sure they do. I don't think we really comprehend the level of chaos that exists in some portions of the meteorite stream from finding to final owner. Yet we do the best we can, trying to abide by rules of provenance and curating. But it is often at the saw that the evidence of poor collecting practices and mishandling in the distant past is revealed. For me lately, the discovery that stones were not what they were believed has been great fun. These revelations have occurred at the beginning of the process and provided me with some excitement while also bringing several new classified meteorites to the world.

Meteorite Times Magazine

Bob's Bulletin – Vol.4 No.3 – May article

Robert Verish

Bob's Bulletin – Vol. 4 No. 3

A newsletter for unclassified meteorites found in the USA.



When it comes to meteorite-hunting you don't always get to choose what days you can go and hunt. Sometimes the weather is so bad you simply have to postpone and make other plans. But sometimes, there is a change in the weather for the good, and you simply have to drop whatever it is you are doing and head out for the desert and start searching for meteorites.

And that is exactly what happened last weekend (the 2nd weekend of May). After a Winter and Spring of chasing after fireballs and hopeful Doppler weather radar reflections (and coming up empty-handed), it was apparent that Summer had started in full-force, what with temperatures now in the 100's and forecast to stay that way for the remainder of the month. But an unexpected change in the weather pattern, forced the forecast to relinquish two more days of "nice weather" before returning to an onslaught of 100 degree highs.

So, what else could I do? I dropped what I was doing and bolted out the door for the desert. And, yes, the weather conditions were perfect. Maybe a little cold at sunrise, when I started my hike, but it was much welcome as the temperatures started to rise. Perfect conditions for a long hike as the wind-speed rose to match the rise in temperature. Conditions were so good that I hiked much farther than I had planned. But I was well-supplied, so it didn't matter that I decided not to return to the truck and camp out on the ground.

I woke up at sunrise the next day with the weather still perfect, and took advantage of this early start to delve even deeper into the desert. I have to admit that, all during the first day I found nothing. Literally, nothing but natural desert. The farther I hiked the less I saw of any trace of humanity; no footprints, no tire tracks, no trash, etc. This propelled me to hike even farther and deeper into the desert. I wasn't discouraged in the least that I hadn't found anything. But eventually, on the second day, I started to encounter some trash. At first, it appeared to be C-ration cans. Then it was empty rounds from a rifle. Then

it was spent 50cal casings. Finally, I started to find more and more rusty shrapnel.

Apparently, I had hiked so far that I had entered into the backside of a military base. Not the first time this has happened to me. On the bright-side, I was no longer on public-lands. No longer did I have to concern myself with Department of Interior contradictory policies regarding meteorites. Yes, federal-lands, but administered by the Department of Defense. And to the best of my knowledge there are no DoD regulations regarding meteorites. (None, not even if you call it an "artifact". Don't forget, the U.S. is no longer a signatory to that pesky UN Treaty, thanks to the current administration.) Certainly, a "brave new world".

Nevertheless, it was time for me to consider the long return trip back to my truck. I plotted on my GPS a "go-to" navigation back to my truck, so that I could take the most direct/shortest route. It wasn't very much later along this back-track that I encountered some more shrapnel. At least, from a short distance it appeared to be a cluster of small shrapnel. (See image below.)



So, I walked over to this cluster of rust and stared down at it trying to confirm that it was just shrapnel. But, I couldn't. I moved over to the left and bent over the largest of the fragments, and stared at it for a while. My mind was taking a while to grapple with the fact that I was not looking at shrapnel, but at rock! A cluster of rust-colored rock fragments. I pulled out my lens and examined this fragment. (I have a magnet stick, but I don't use it to confirm that a rock is a meteorite. I use a magnet to confirm that a rock isn't a chondrite!)



My visual examination confirmed there was a patch of relict-looking fusion-crust, and finally, through the desert-patina on the surface of this fragment, I spotted some orange-colored chondrules. Forgive me if I admit to not making a big celebration about making this find, but realize the long line of chondrites that I have written about that are still awaiting their turn to get classified. Besides, my mind was already preoccupied with how many hours it was going to take to get back to my truck, and how I was going to proceed with recording the recovery of all of these fragments.



It wasn't until I returned home and had time to take a couple fragments to cut a sample for a thin-section, that I realized the interior is packed chondrule to chondrule, and are well-defined. Realizing now that this meteorite could be a very uncommon chondrite, I decided to make this find the subject of my article for this month. A very last minute change of mind, but I'm doing this in the hope of generating some interest in getting this meteorite classified. Don't be surprised if you should see this meteorite have a ["Go Fund Me"](#) page in the near future in order to generate funds to get it classified.

Because this is a recent recovery, this month's edition of the "Bulletin" will be unavoidably short.

*** Note: The meteorite depicted in this month's article was found by Bob Verish. ***

These chondritic stone fragments were found by the author on May 13th 2018. (Except where noted, all of the images in this article were taken by me.)

Since this month's find is so recent, and a thin-section is still in the fabrication process, I will forego the "Petrographic Description" and go directly to the "Macroscopic Description". In other words, this Newsletter will basically be a Photo Gallery. In any case, I hope the reader will enjoy the images.

Newsletter for an Unclassified (a.k.a., Orphaned) Meteorite found in the USA – Volume 4 No. 3 — May 2018

Macroscopic Description for Field ID#: **UU180513**

This meteorite comprises more than 10 dozen very weathered, angular fragments. The average size of these fragments is 10 grams, with the exception of three larger pieces. A third of the fragments are clearly exterior pieces by evidence they each still retain a patch of relict fusion-crust. Being sharp-edged, some of the fragments are interlocking (much in the manner as pieces of a 3-dimensional puzzle). Efforts are still ongoing to reconstruct the meteorite, fragment by interlocking fragment. This effort has resulted in each of the "three larger pieces" getting actually

larger, but those three pieces still fail to interlock. As a consequence, this effort has shown that there are many more fragments still unrecovered.

Meteorite-Recovery Information for Field ID#: UU180513

Due to the on-going recovery of addition fragments at this locality for this meteorite, this edition of the Newsletter is going to forego (until it is “officially approved”) the publishing of “Recovery Information” that usually appears here. As of the writing of this article, there have been a total of 120 fragments so far recovered with a current TKW of 1,080grams. For now, what will appear here will be a gallery of images of this recent find, a chondritic stone (apparently unequilibrated) and given Provisional # UU180513.

Gallery of Images for Unclassified USA (UU) “Orphaned” Meteorite — “UU180513”:

PROV. # — Field ID No. — Mass — Specimens — Notes: UU180513 — CA180513 — >1,080g — >120 fragments — possible LL3.

Photo Gallery of the FRAGMENTS & TYPE-SPECIMEN for the meteorite find appearing in this edition of “Bob’s Bulletin” Newsletter:

UU180513:



Above is the image of all of the fragments of “UU180513” currently recovered. The pieces on the right still retain some of the devitrified, relict fusion-crust on their weathered, caliche-covered exteriors. The smaller fragments on the left are from the interior of this chondritic stone and have no caliche.

UU180513:



Above is the image of all of the larger fragments of "UU180513", each of them retaining a patch of the devitrified, relict fusion-crust on the weathered, caliche-covered exterior.

UU180513:



Above is the image of all of the smaller fragments of "UU180513", coming from the interior of this chondritic stone and have no caliche, which means they are less weathered. An assortment of these fragments will comprise the eventual type-specimen. What remains will be retained for collectors.



Above is an image of three of the more than 120 fragments from the “UU180513 – cluster”, two of which have had their cut surface polished (which shows a weathered, yet potentially unequilibrated interior).



Above image is of a "UU180513" fragment after having a sample cut for a thin-section of the type-specimen, showing the potentially unequilibrated-chondrite interior. This specimen was made "wet" with denatured alcohol.



This is a close-up image of the cut & polished surface for the above fragment (previous image). This is typical for all the other >120 fragments from the "UU180513 – cluster" (showing a potentially unequilibrated interior).



Above is a close-up image of the other fragment which was cut & polished — one of the more than 120 fragments from the “UU180513 – cluster” (which shows a weathered, yet potentially unequilibrated interior). This specimen was made “wet” with denatured alcohol.



Above is a close-up image of the cut & polished surface for one of the more than 120 fragments from the "UU180513 – cluster" (which shows a potentially unequilibrated interior).



Don't be surprised if you should see this meteorite have a ["Go Fund Me"](#) page in the near future in order to generate interest in getting it classified.

The above "Newsletter" is just one example of a way in which to record U.S. Unclassified Ordinary Chondrite (UUOC) meteorite finds. Thankfully, these Bulletins have brought attention to the problem of the increasing number of O.C. meteorites found here in the USA, not only going unclassified, but even going unreported. Although this is not a permanent solution, this "stop-gap measure" is better than nothing, and is certainly better than letting this problem perpetuate.

In the meanwhile, I will do my part and start to submit the required type-specimens & thin-sections (for now into a personal repository) until a permanent "foster-home" can be found for what we know to be genuine, yet "orphaned meteorites".

References:

[Bob's Bulletin – Vol. 4 No. 2](#) — In my [10th Bulletin](#), I published a single "Provisional (UU) Number" for an

Unclassified U.S. meteorite find that, although it came from an existing Dense Collection Area (DCA), the finder could not get a NomComm-assigned provisional number assigned to his meteorite.

PROVISIONAL # — Field ID No. — Mass — Notes: UU180122 — AZ180122 — 42.6g — single stone has had its GPS coordinates recorded.

[Bob's Bulletin – Vol. 4 No. 1](#) — In my [9th Bulletin](#), I published a table of six (6) “Provisional (UU) Numbers” (for Unclassified U.S. meteorites) that I assigned to some finds from four (4) separate localities:

PROVISIONAL # — Field ID No. — Mass — Notes: GPS coords recorded for each stone.
UU151212V — CA151212V — 129.6g — one of 22 fragments found in a tight cluster by Mark Bittmann, et al, (and this is the 1 fragment found by Bob Verish). **UU160618** — CA160618 — 52.5g — type-specimen cut & thin-section — found by Mark Bittmann **UU170407** — CA170407 — 16.3g — type-specimen cut & thin-section — found by Mark Bittmann **UU161111X** — C161111X — 1,075g — sample cut & thin-section; main-mass with Bob Verish **UU161212F** — C161212F — 18.25g — type-specimen cut & thin-section; main-mass with Bob Verish **UU161213H** — C161213H — 70.8g — type-specimen cut & thin-section; main-mass with Bob Verish

*** Note: The above 6 meteorites represent 4 localities. ***

[Bob's Bulletin – Vol. 3 No. 1](#) — In my [8th Bulletin](#), I published a table of sixteen (16) “Provisional (UU) Numbers” (for Unclassified U.S. meteorites) that I assigned to some finds from an existing DCA, but were refused entry into the MBD:

PROVISIONAL # — Field ID No. — Mass — Notes: each stone has GPS coords recorded.
UU140705A — CA140705A — 2.0g — physically-paired to UU150110 **UU140705B** — CA140705B — 8.25g — sample cut & thin-section; main-mass with Mark Bittmann **UU140719** — CA140719 — 8.9g — sample cut & thin-section; main-mass with Mark Bittmann **UU140726** — CA140726 — 4.7g
UU140726B — CA140726 — 15.8g **UU140819** — CA140913A — 1.2g **UU140913A** — CA140913A — 5.2g **UU140913B** — CA140913B — 3.4g **UU140919** — CA140919 — 5.9g **UU140923** — CA140923 — 8.9g **UU141001** — CA141001 — 8.9g **UU141220** — CA141220 — 2.6g — sample cut & thin-section; main-mass with Mark Bittmann **UU141227** — CA141227 — 1.9g **UU150103** — CA150103 — 11.6g — physically-paired to UU151228 **UU150110** — CA150110 — 2.8g — sample cut & thin-section; main-mass with Mark Bittmann — physically-paired to UU140705A **UU151228** — CA151228 — 1.9g — sample cut & thin-section; main-mass with Mark Bittmann — physically-paired to UU150103

*** Note: All of these meteorites were found from a single locality, an officially designated DCA. ***

In all of my previous Bob's Bulletins, I prefaced each one with an explanation of what I mean by the phrase “orphaned-meteorites from the USA”. I defined “orphaned” as being meteorite “finds” that are recovered in the U.S., but are not being recorded. Contrary to what you may think, these meteorites are being reported, but the finders of these meteorites have encountered resistance in getting provisional numbers assigned to their finds, even when the (obvious) meteorites were recovered from officially designated “Dense Collection Areas” (DCA). These meteorites are being ignored. This is in addition to the current practice by the official classifiers of meteorites to refuse to classify Ordinary Chondrites (OC). Without an “official” classification, meteorites cannot get an officially-approved name by the Nomenclature Committee of the Meteoritical Society, and hence, cannot be cataloged. And hence, uncatalogued meteorites are “orphaned”.

Unfortunately, the vast majority of new U.S. finds are destined to remain orphans.

In my preface I would go on to explain that these “Unclassified U.S. finds” (UU) were being orphaned from the family of “approved” meteorites for the following reasons:

- 1) The lack of funding for U.S. researchers to authenticate, classify, and document/record these U.S. OC finds has resulted in several new [negative] trends, all which discourage finders from reporting their finds.
- 2) The increasing trend of commercializing the classification of meteorites by U.S. researchers has priced U.S. OC finds out of the market, and
- 3) The increasing trend of U.S. researchers to turn away OC finds, even when finders of U.S. OC meteorites are willing to pay for their classification.

[Bob's Bulletin – Vol. 2 No. 3](#) — In my [7th Bulletin](#), I published a table of six (6) “Provisional (UU) Numbers” (for Unclassified U.S. meteorites) that I assigned to some recent finds:

*** Note: All of these meteorites were found by one person (not this author) – all in one day. ***

Bob's Bulletin – Vol. 2 No. 2 — In my **6th Bulletin**, I published a table of the increasing number of unclassified U.S. meteorite finds and petitioned that crowd-sourced funding be used for volunteers to compile and record these finds for later classification and official-approval, until such time that this function can be properly funded with U.S tax-dollars.

Bob's Bulletin – Vol. 2 No. 1 — In my **5th Bulletin**, I published a table of all the unclassified finds from Coyote Dry Lake DCA that were reported prior to 2007.

Bob's Bulletin – Vol. 1 No. 4 — In my **4th Bulletin**, I reported that several U.S. researchers were volunteering their time and effort to record and publish meteorite falls and finds, such as, Creston and Misfits Flat. I suggested that this method of cataloging newly found US meteorite specimens could be expanded, but the main hindrance is that there is no funding for this kind of effort.

Bob's Bulletin – Vol. 1 No. 3 — In my **3rd Bulletin**, I proposed the idea of an on-line database for these “orphaned” and other unclassified U.S. meteorites. This would have to be an all-volunteer effort, much in the same manner that the American Meteor Society has established the Fireball

Reporting System. This database would give finders a central point to report their finds and have a field ID number issued to them. This “Field ID” would reflect which US state and date of find. The function of this database should not be confused with already established processes of getting a meteorite “classified”, which is obviously way more labor intensive and costly.

Bob's Bulletin – Vol. 1 No. 2 — In my **2nd Bulletin**, I went into more detail about why I use the phrase “orphaned-meteorites from the USA”. I focused on the lack of U.S.-tax-dollar-funding and why no funding was going towards the classification of these particular meteorites. In hindsight, I now realize that I should have pointed-out that there is also a lack of funding for just authenticating and recording that a U.S. meteorite has been found. This function should never be confused with “classifying” a meteorite, which is obviously way more labor intensive and costly.

Bob's Bulletin – Vol. 1 No. 1 — In my **first Bulletin**, I introduced the phrase “orphaned-meteorites from the USA”. I defined these “orphans” as being unwitnessed-fall Ordinary Chondrite (OC) meteorite “finds” that are recovered in the U.S. Unfortunately, the vast majority of U.S. finds are of this type. I went on to write that these U.S. finds were being orphaned from the family of “approved” meteorites for the following reasons:

- 1) The lack of funding for U.S. researchers to authenticate, classify, and document/record these U.S. OC finds has resulted in several new [negative]; trends.
- 2) The increasing trend of commercializing the classifying of meteorites by U.S. researchers has priced U.S. OC finds out of the market, and
- 3) The increasing trend of U.S. researchers to turn away OC finds, even when finders of U.S. OC meteorites are willing to pay for their classification.

Meteoritical Bulletin: the search results for all provisional meteorites found in “USA” – Published by Meteoritical Society – Meteoritical Bulletin, Database.

If you “Click” on the header titled “Assigned On”, it will change the table to chronological order by date of assignment, and it will show that – SINCE 2014 – there have been no new Provisional Numbers assigned to a find made in the United States!

Meteorites of California

the list of formally-recognized California meteorite falls and finds.

My previous Bob's Bulletins can be found ***HERE***

If you would like to sponsor any of these orphans, and help in getting them classified, in order to get them entered into the Meteoritical Bulletin Database, then please contact me by email:

bolidechaser at yahoo-dot-com

Meteorite Times Magazine

NWA 820 L3-5

John Kashuba

Ahmed Pani was selling this brecciated L chondrite in Tucson in February 2017. The mineral dealer from Vienna had one slice with a distinct dark clast that I should have bought. Luckily he had a similar slice available when we saw him at the Munich show in October. It turned out to be beautiful in thin section.

The dark clast is similar to the impact melt rock (crystallized fallback material) found in NWA 869, an L3-6. Barred olivine appears in several forms. There are distinctly brown cryptocrystalline and radial pyroxene chondrules. And numerous chondrules are jacketed with fine grained dust. One chondrule has a dark glassy mesostasis surrounding large olivine phenocrysts.

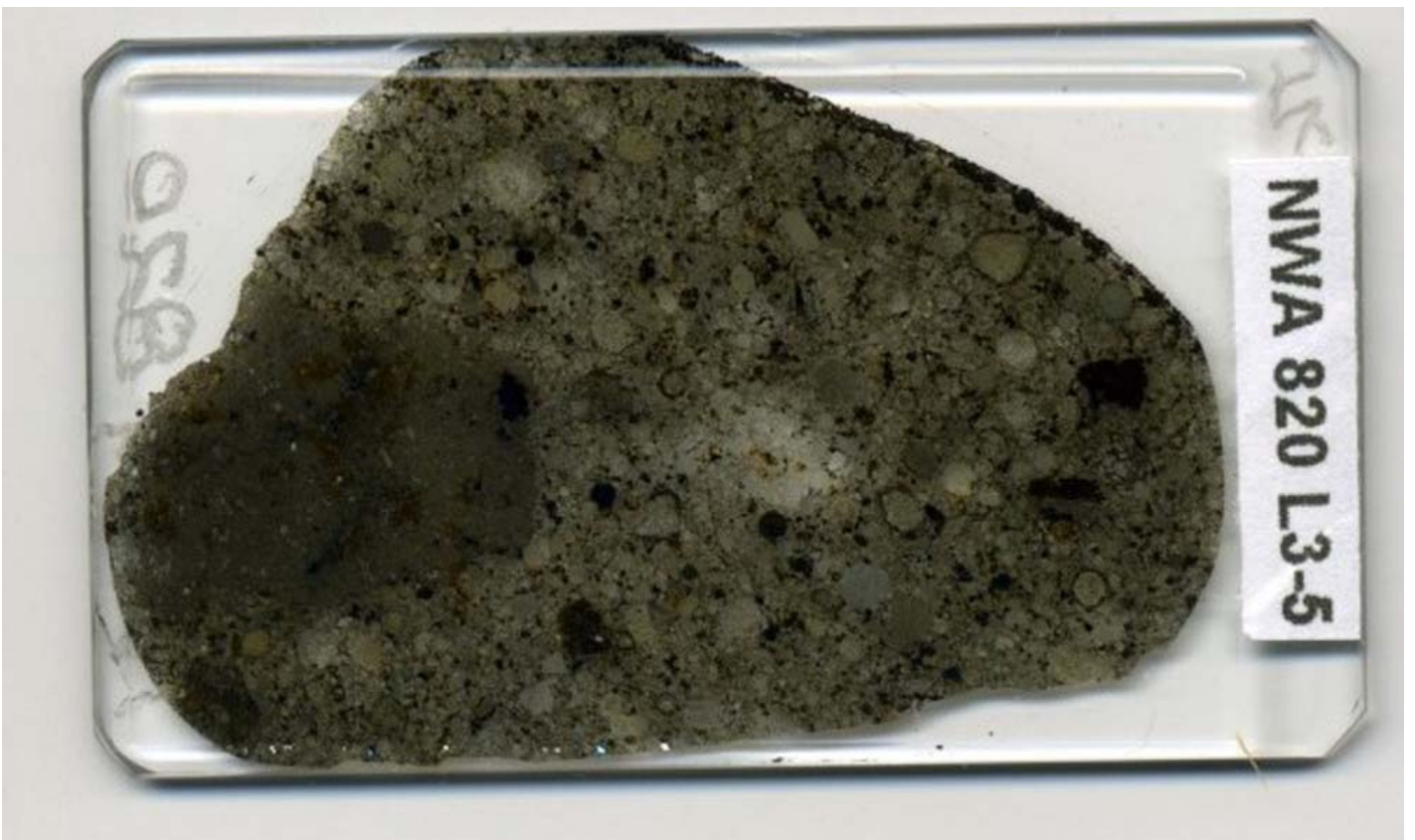
The variety of textures makes this thin section a pleasure to peruse.



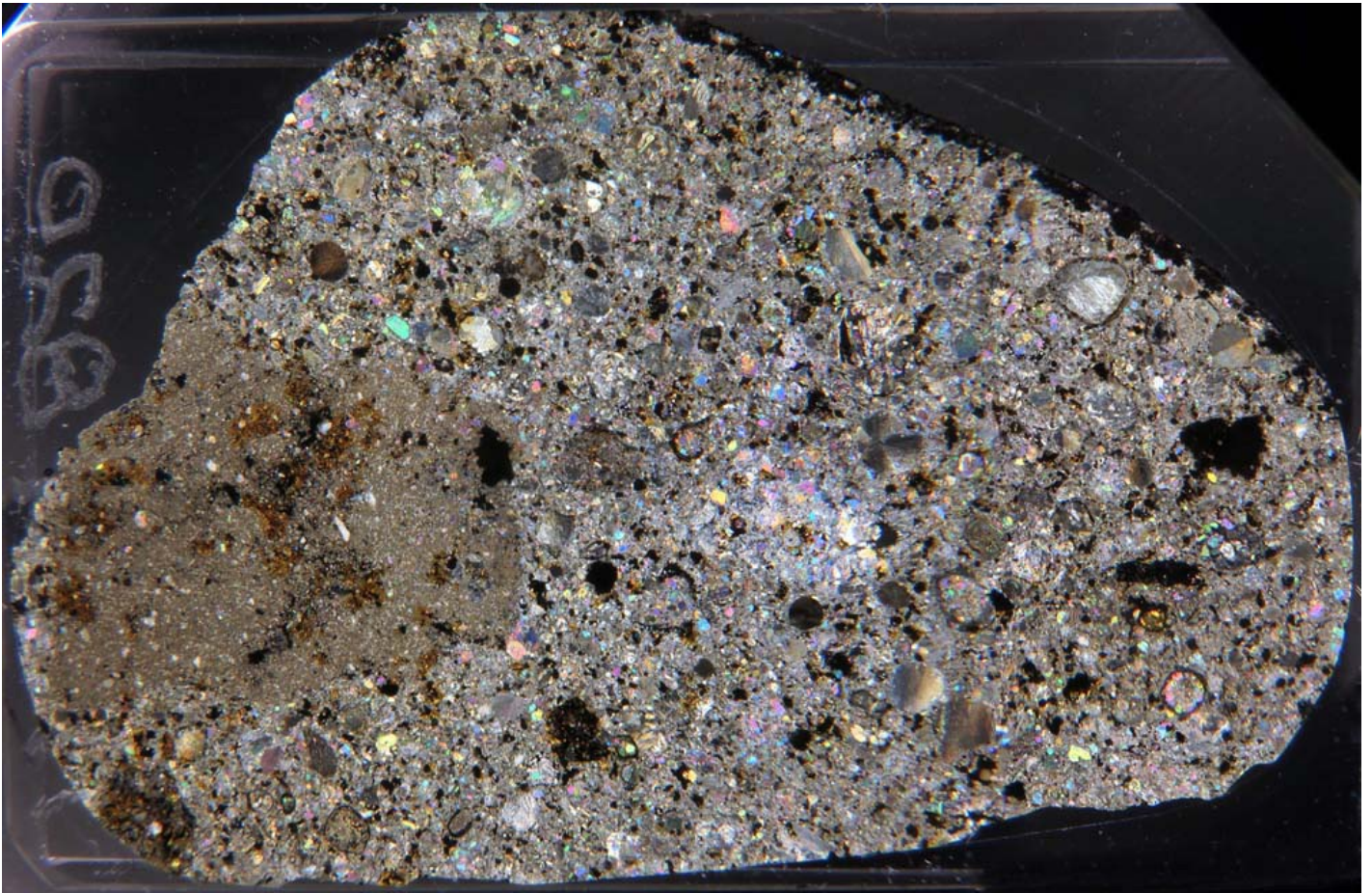
The original part slice was about 2 inches long.



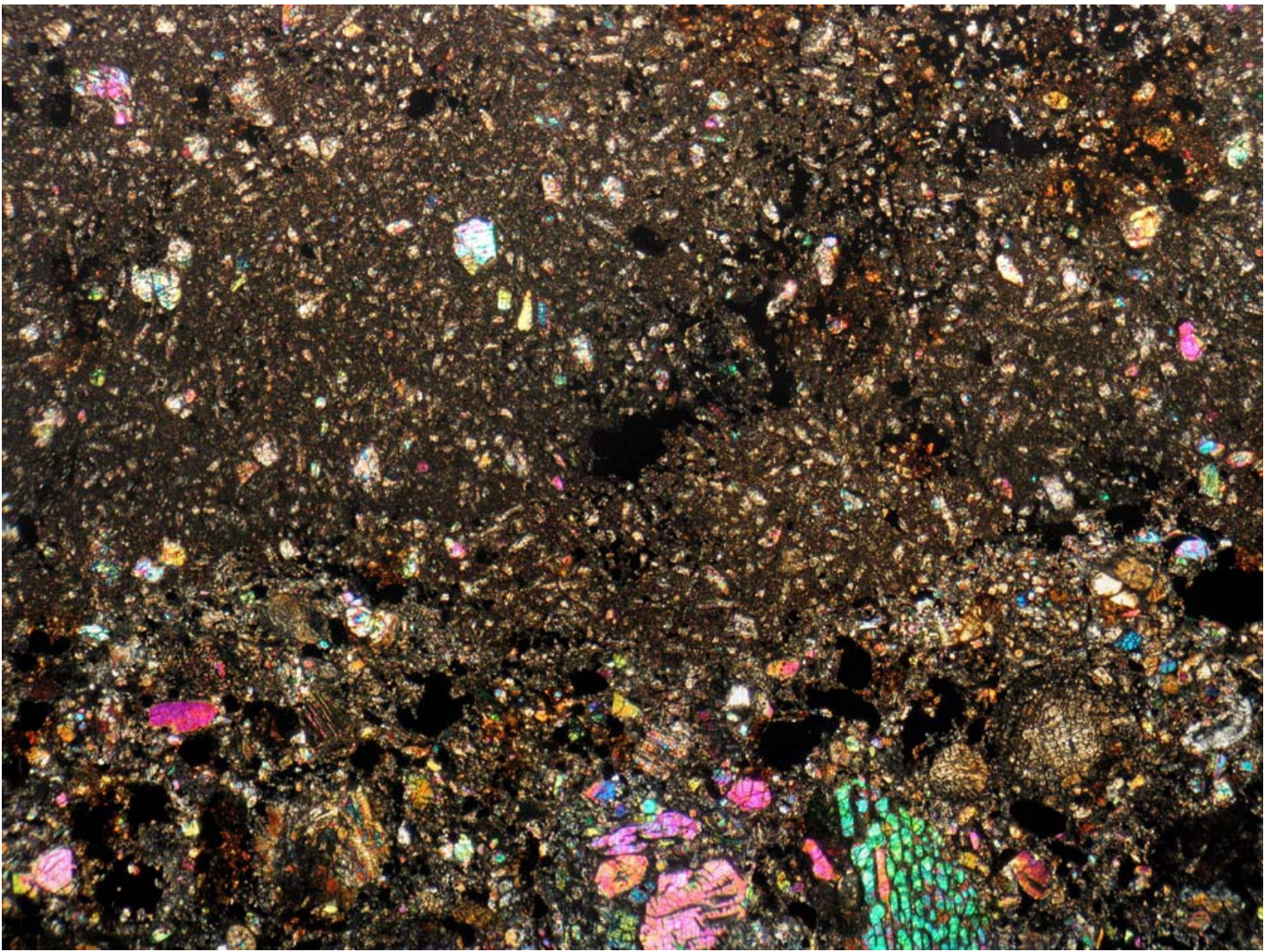
The other side with the dark gray inclusion to the center left.



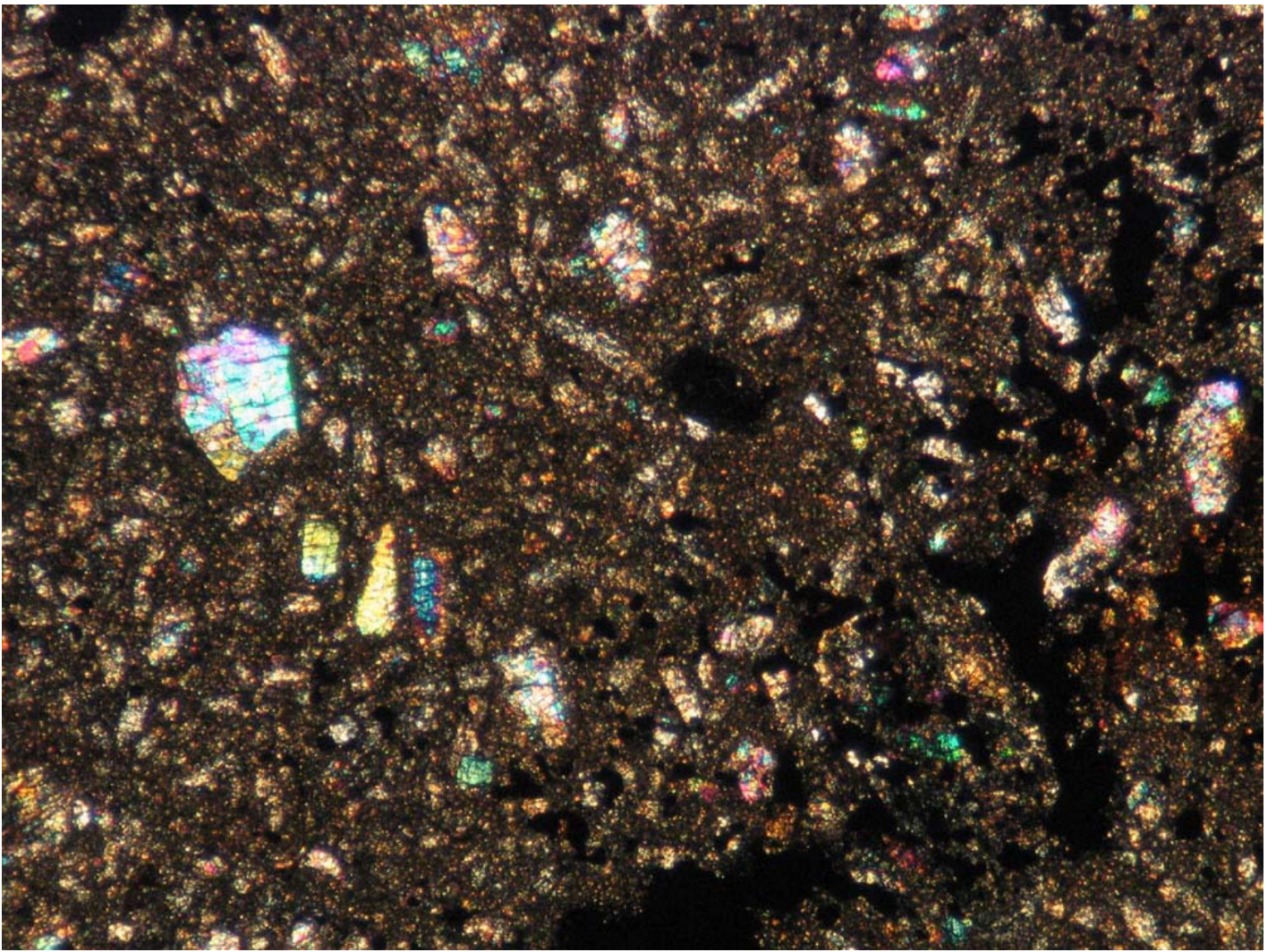
Thin section in incident light.



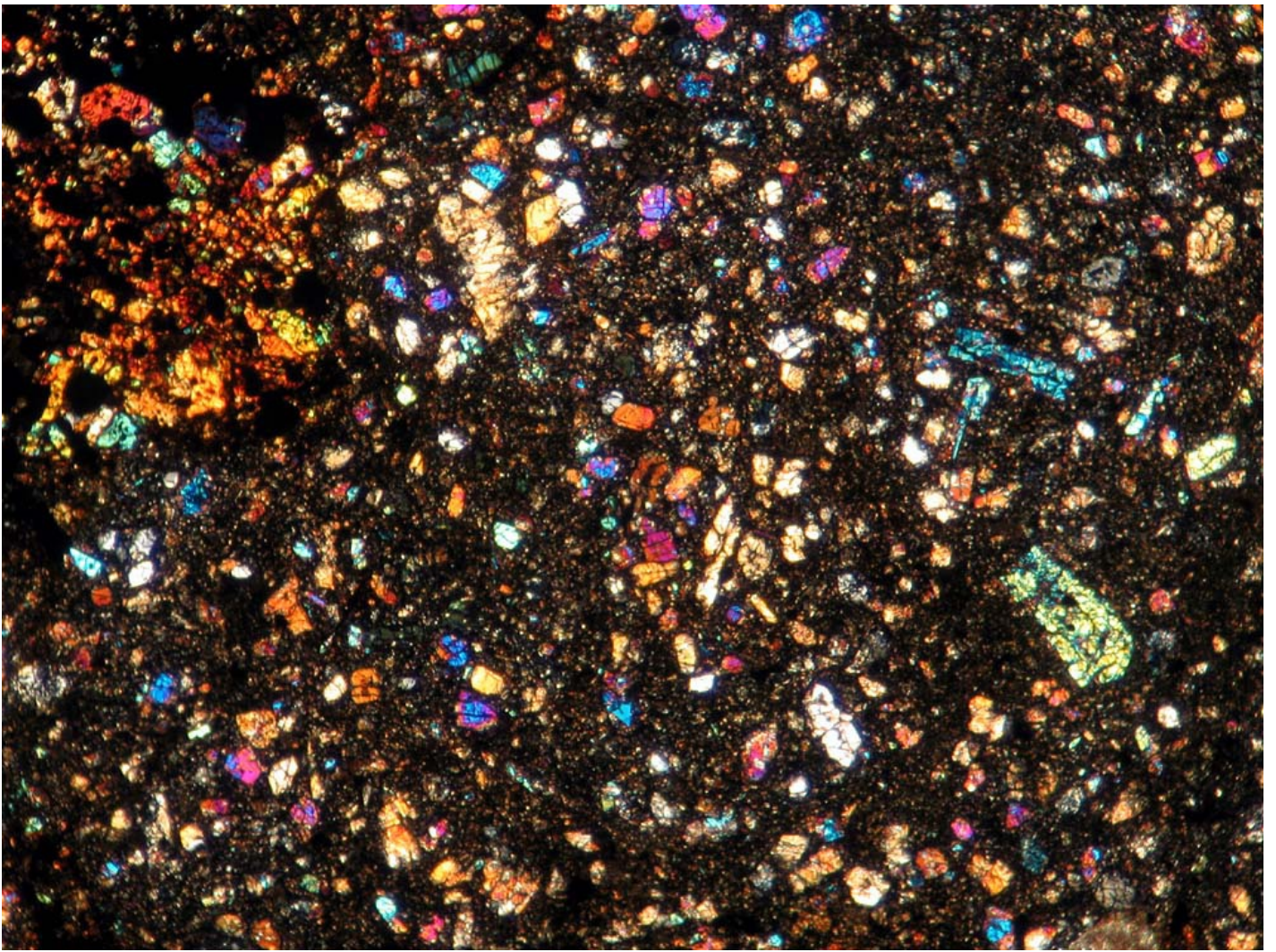
Thin section in transmitted cross polarized light (XPL).



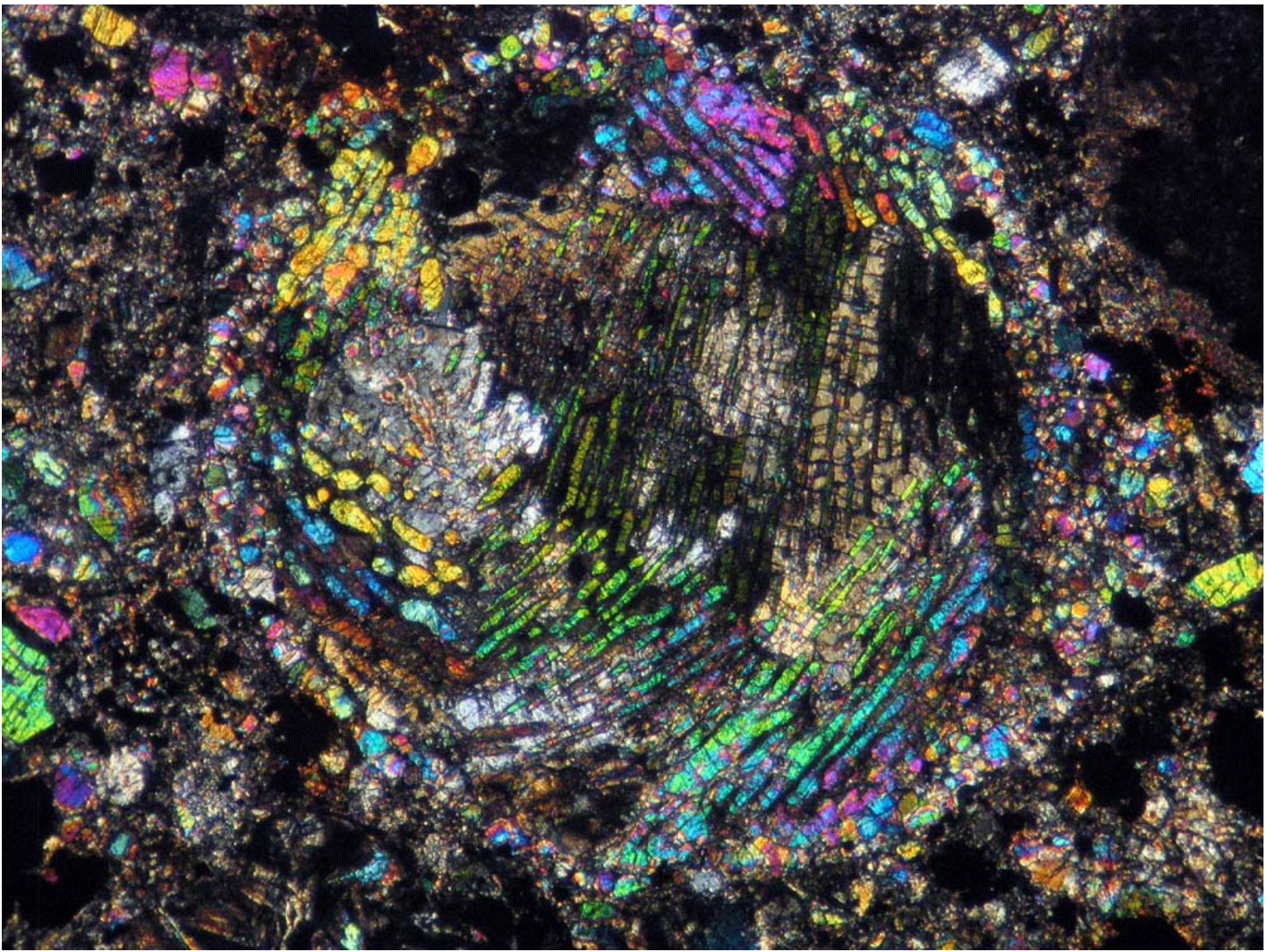
The dark gray inclusion is a clast of impact melt rock, shown here in the upper 2/3 of the photo. It is similar to those in NWA 869. Field of view is 8.5 mm wide. XPL.



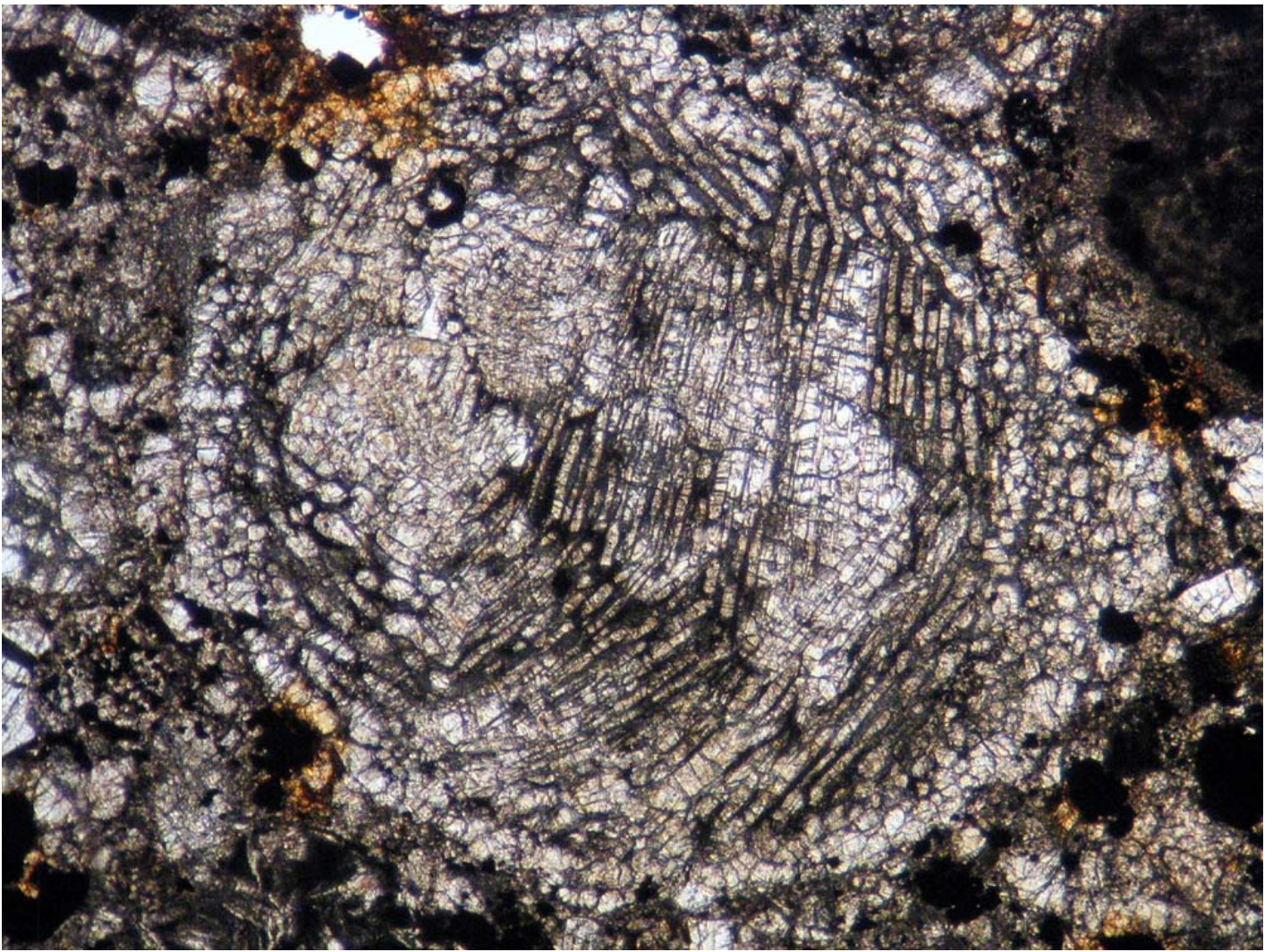
Detail of above photo. FOV=3.1mm. XPL.



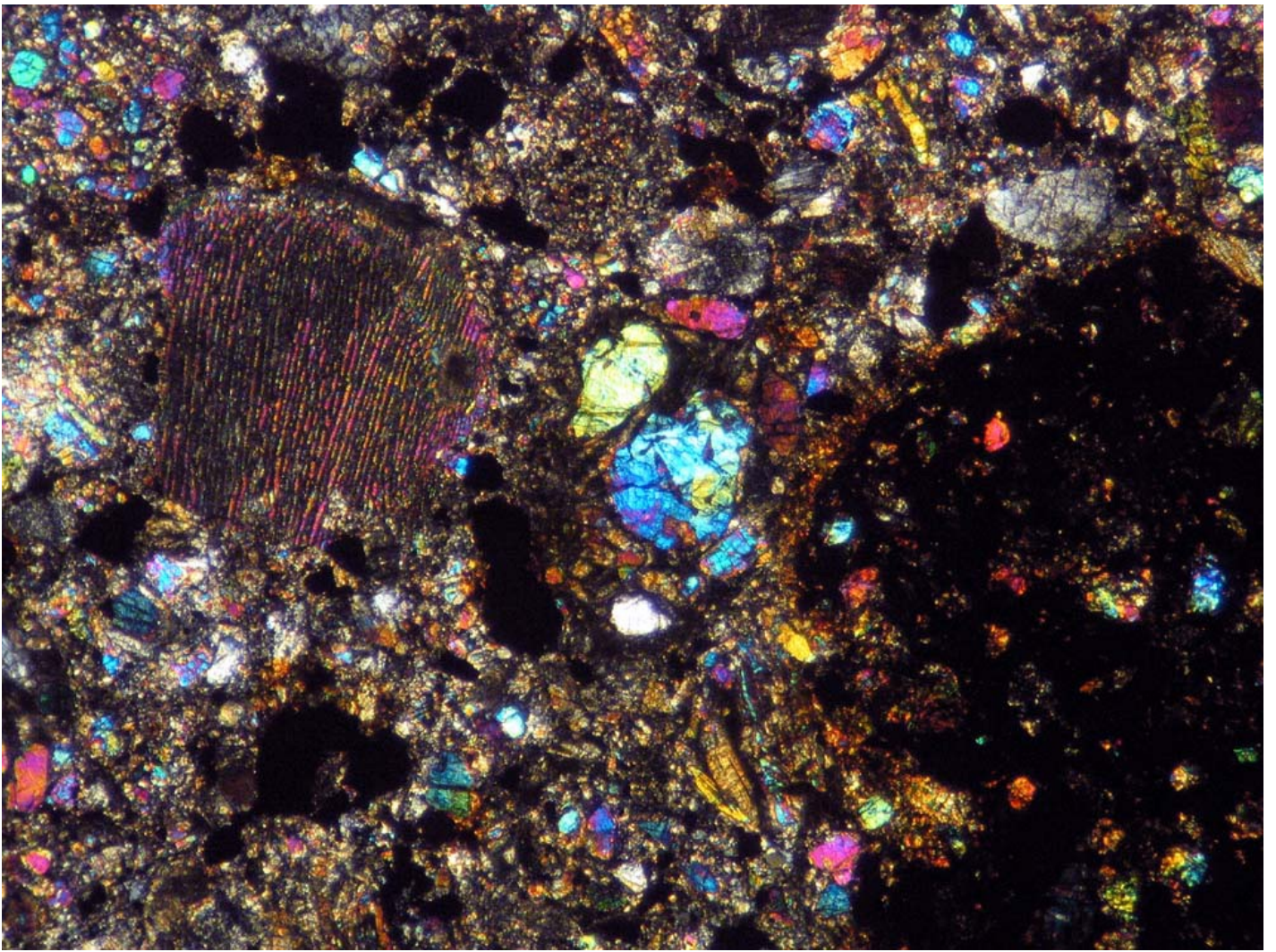
Detail of similar clast in NWA 869 L3-6. FOV=3mm. XPL.



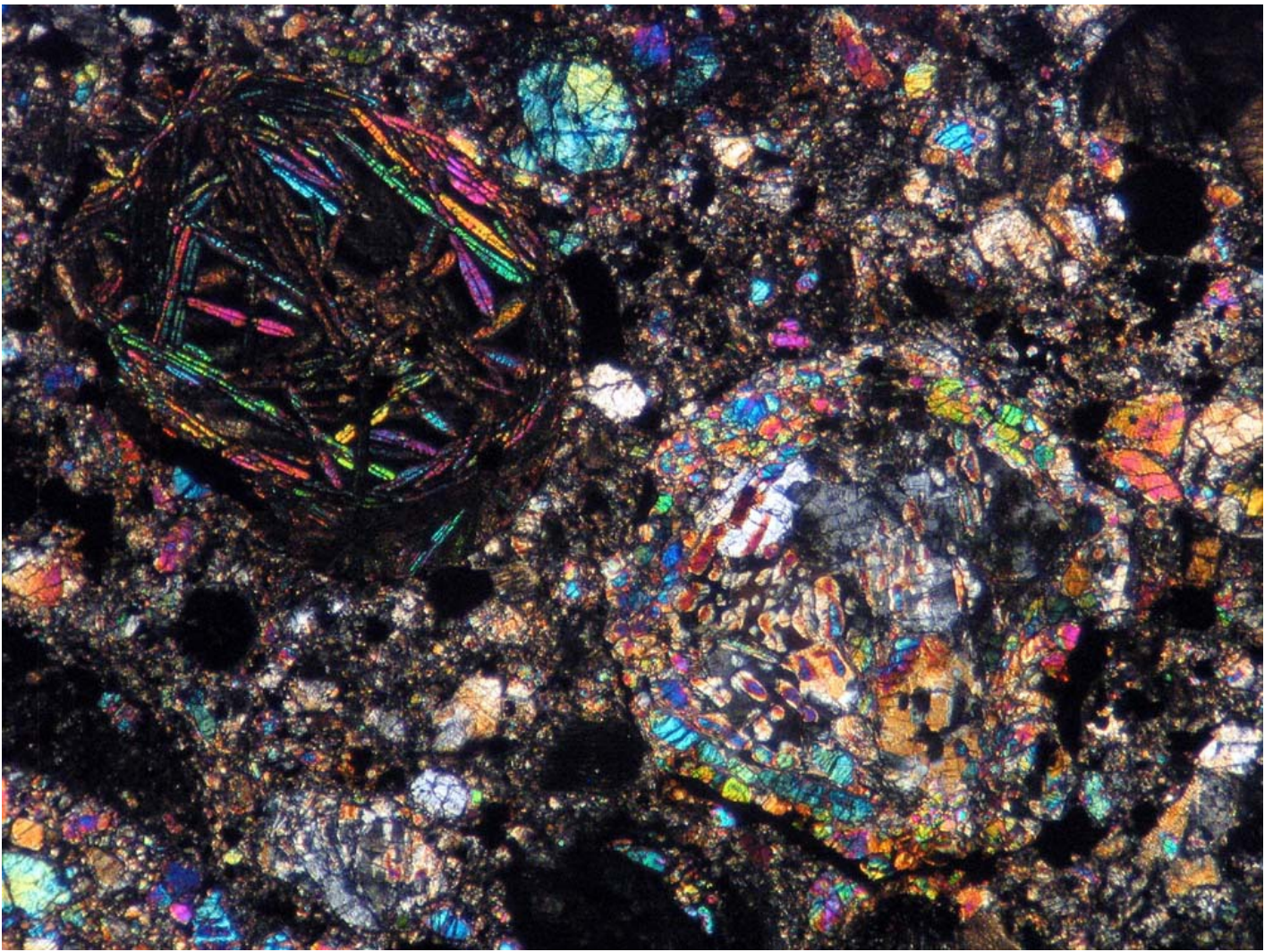
Cross section of a barred olivine (BO) chondrule with multiple sets of bars. Chondrule is about 2mm in diameter. XPL.



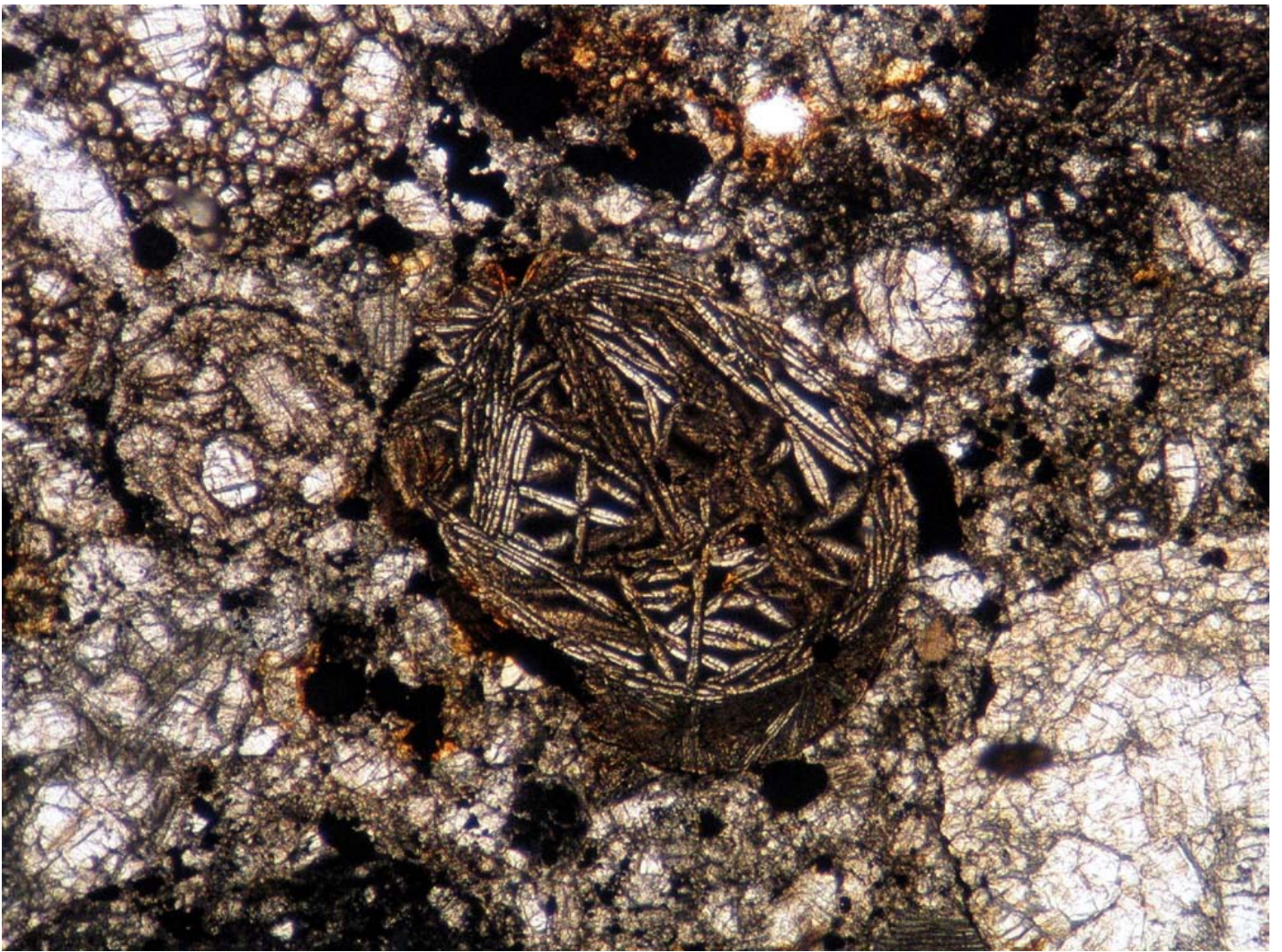
Same chondrule in plane polarized light (PPL).



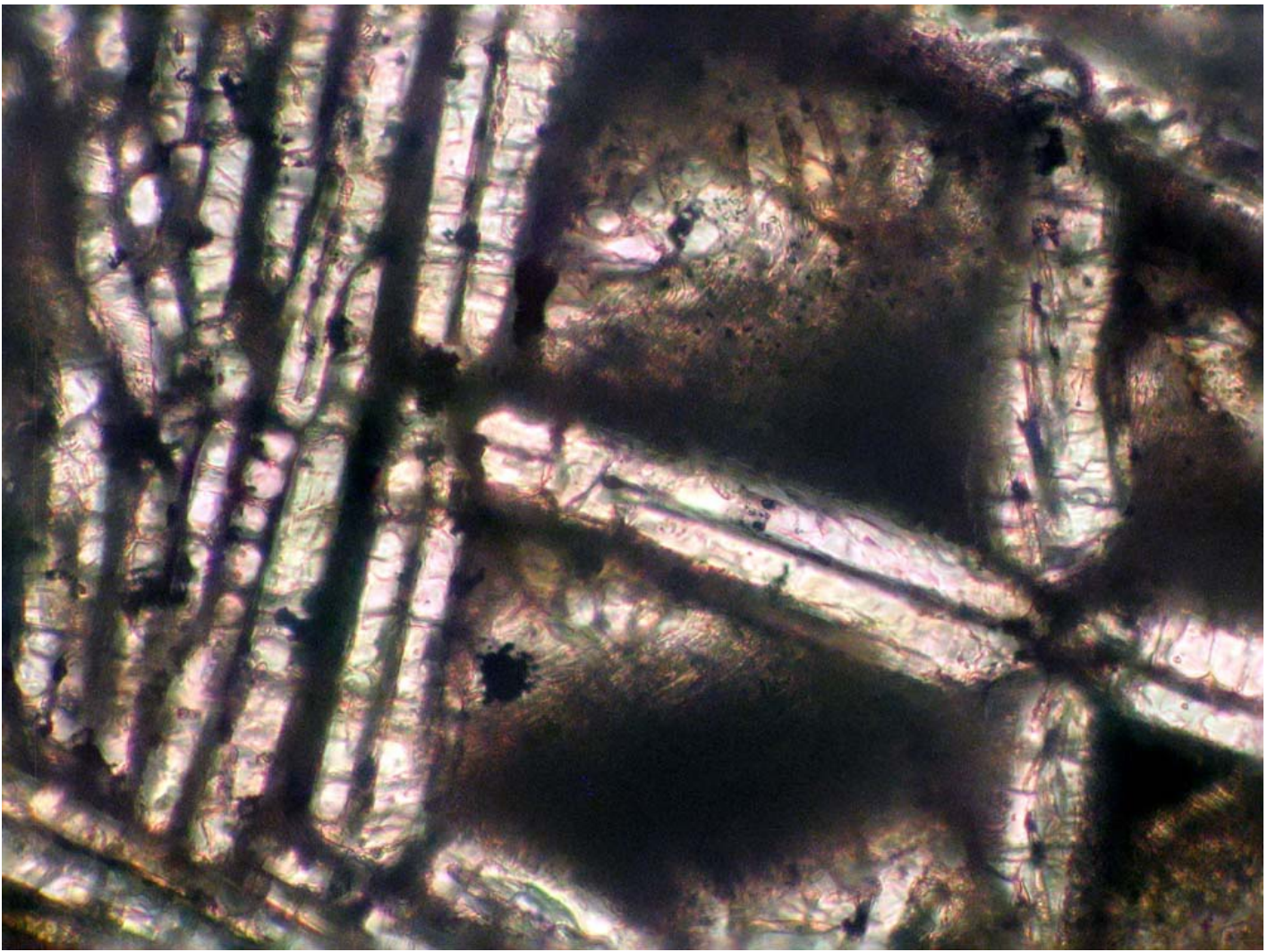
BO chondrule with fine bars. FOV=3.1mm. XPL.



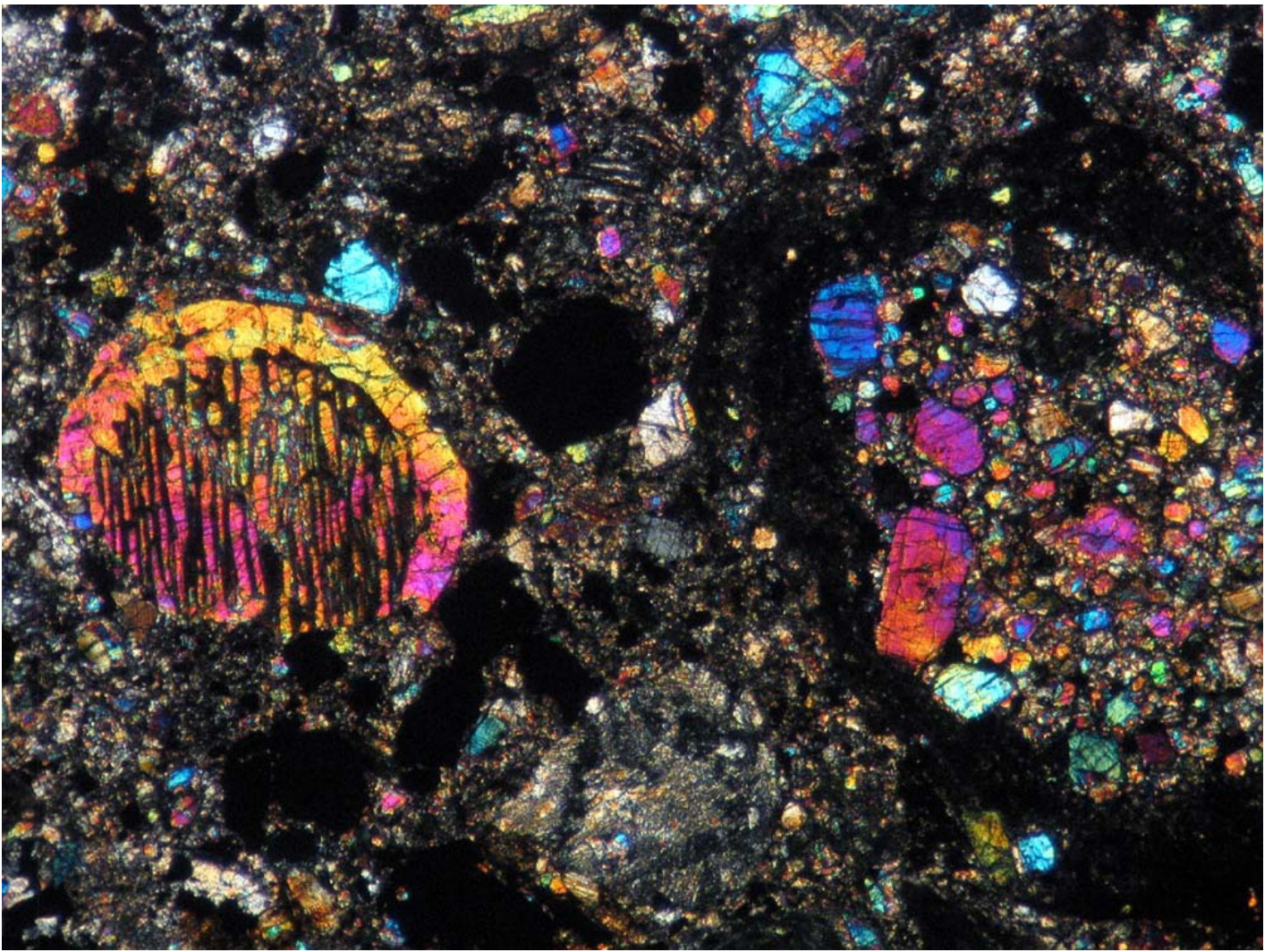
Upper left chondrule has olivine laths in many orientations hence in many colors. FOV=3.1mm. XPL.



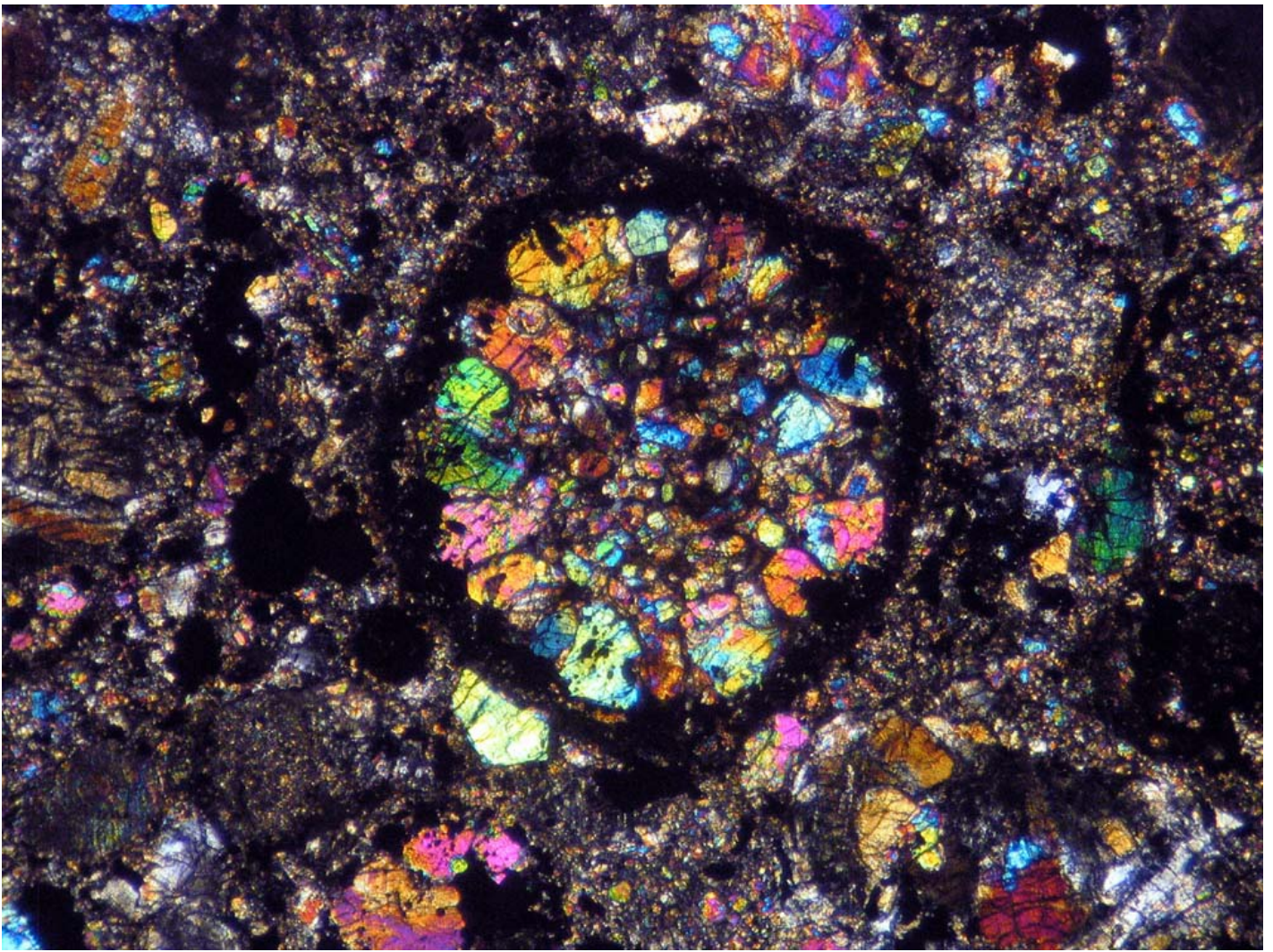
Same chondrule in PPL.



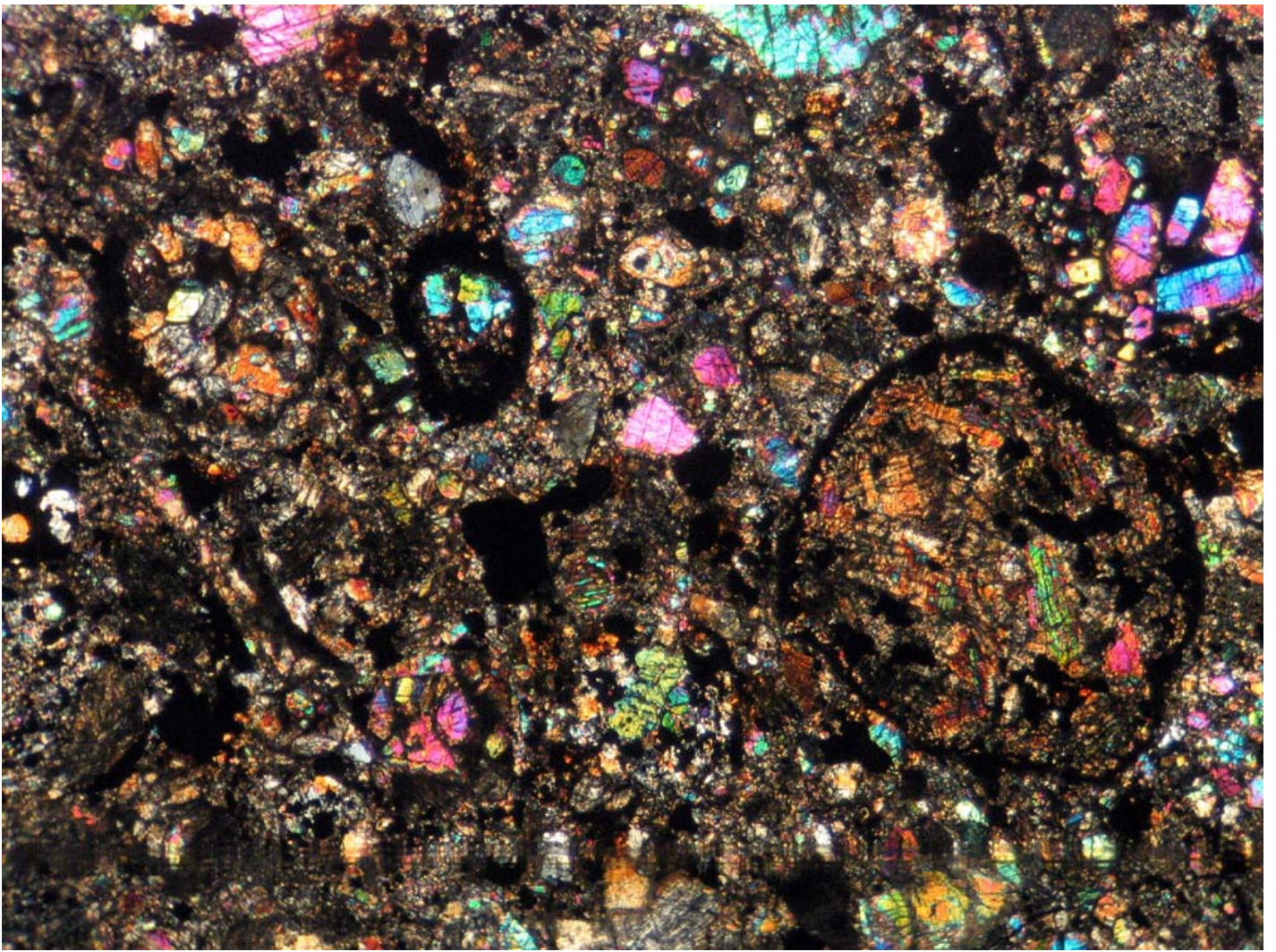
Same chondrule up close. The olivines are somewhat skeletal. FOV=0.3mm. PPL.



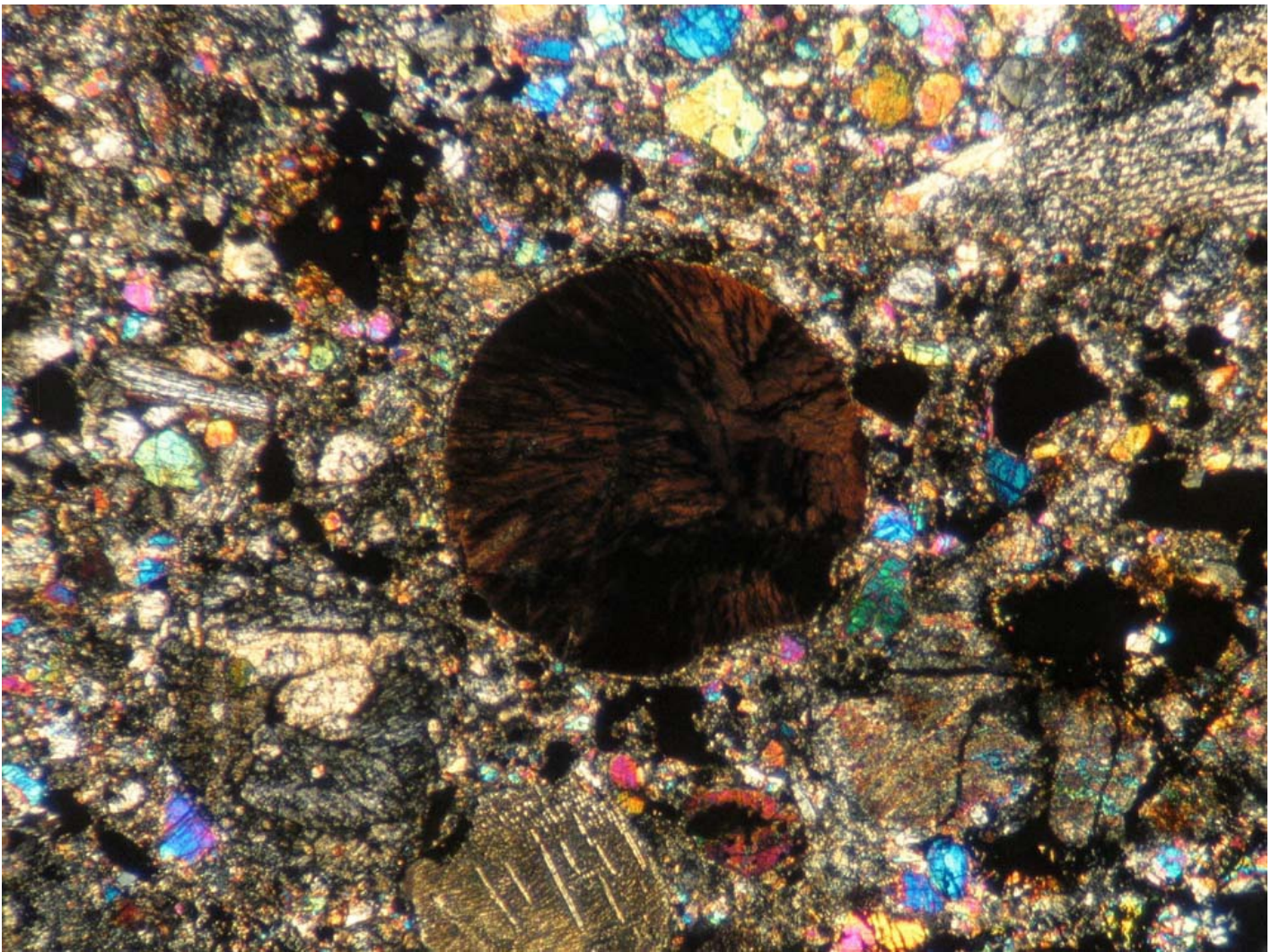
Left, fragment of a typical BO chondrule with a thick rim. Right, chondrule with thick coating of opaque dust. FOV=3.1mm. XPL.



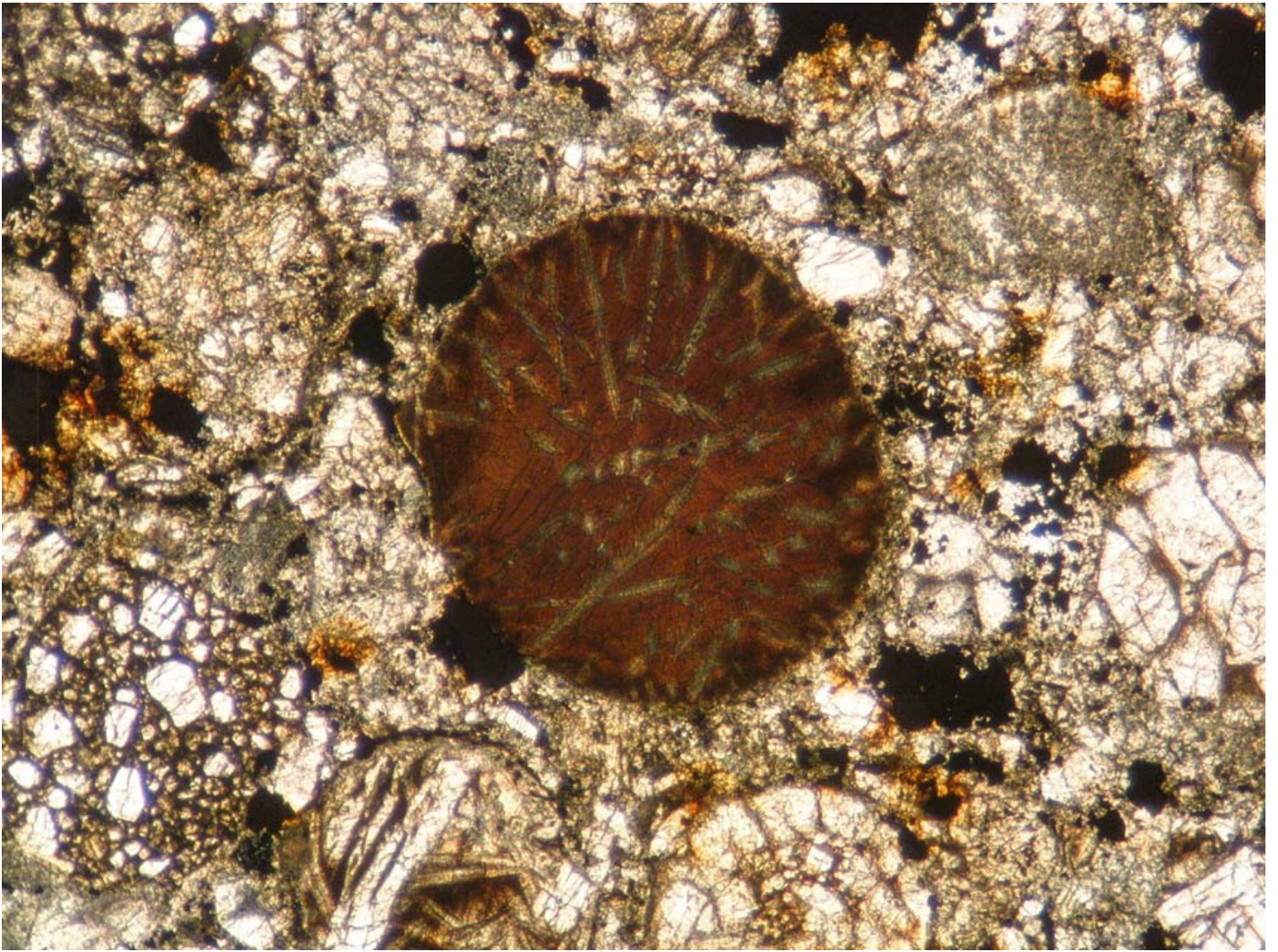
Chondrule with a thick dust jacket. Diameter=1.3mm. Notice that the mineral grains are larger on the outside of the chondrule than on the inside. XPL.



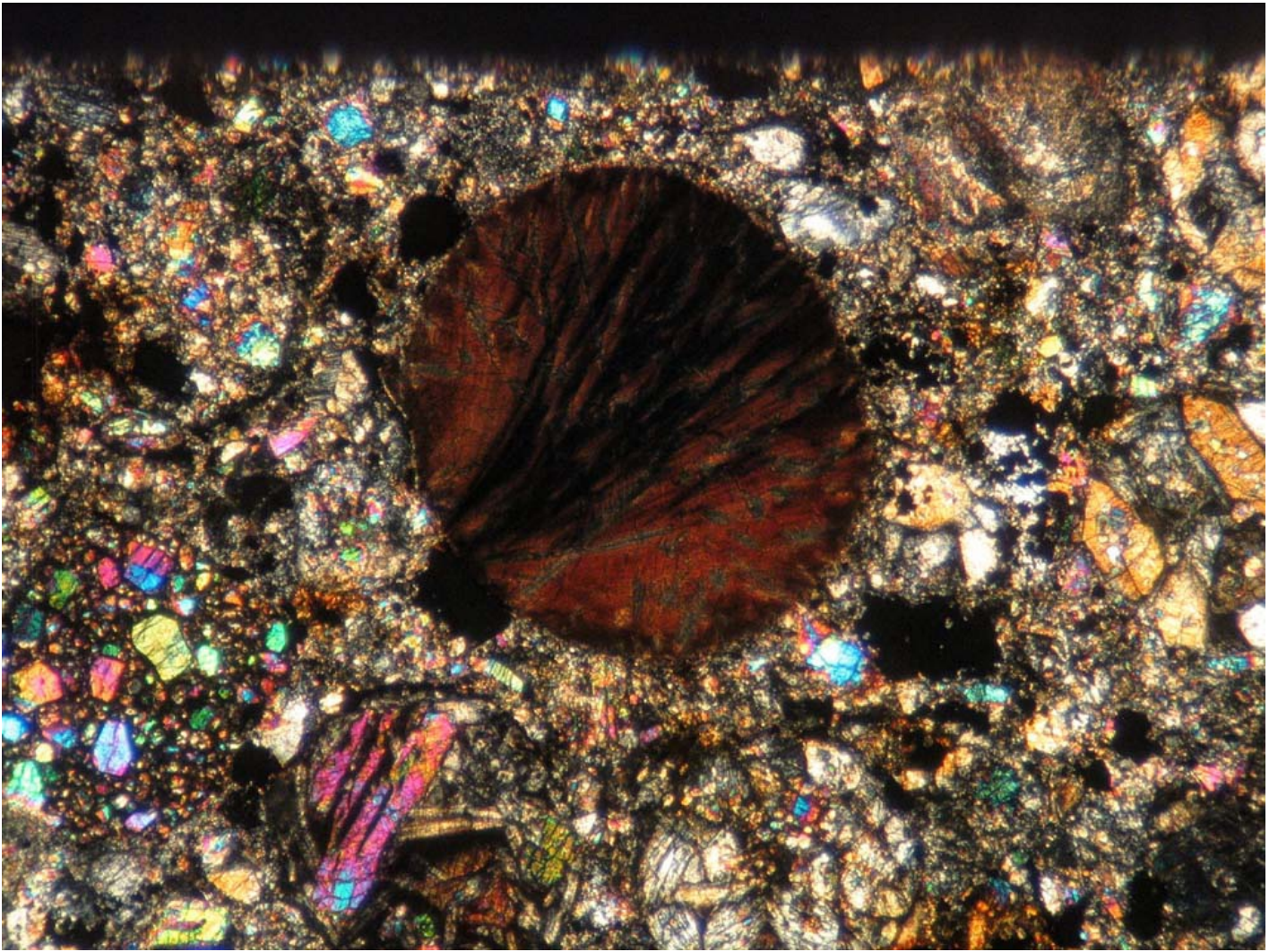
Chondrules with opaque dust jackets. FOV=4.4mm. XPL.



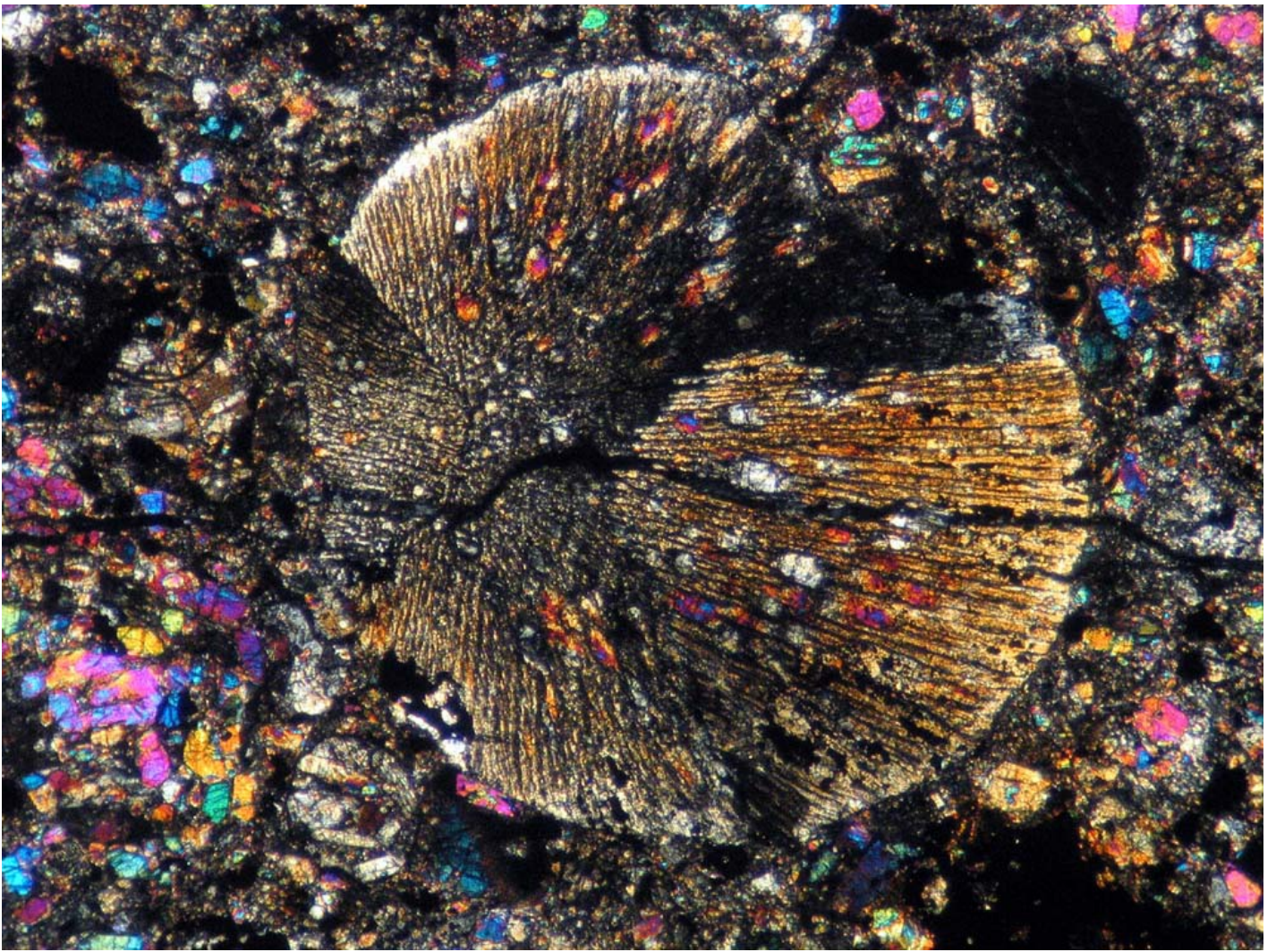
Cryptocrystalline chondrule. Diameter=1.0mm. XPL.



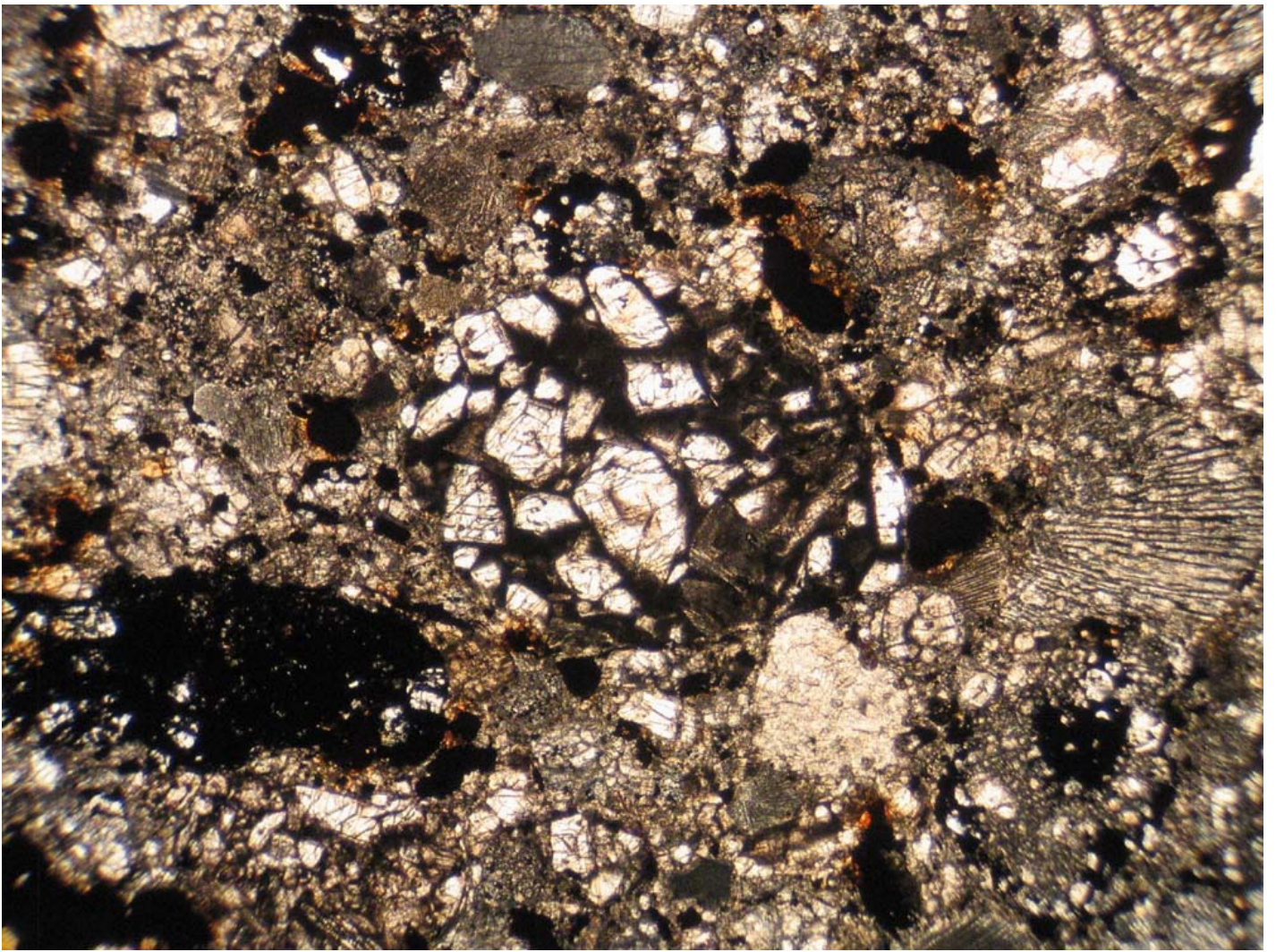
Radial pyroxene chondrule. Diameter~1.2mm. XPL.



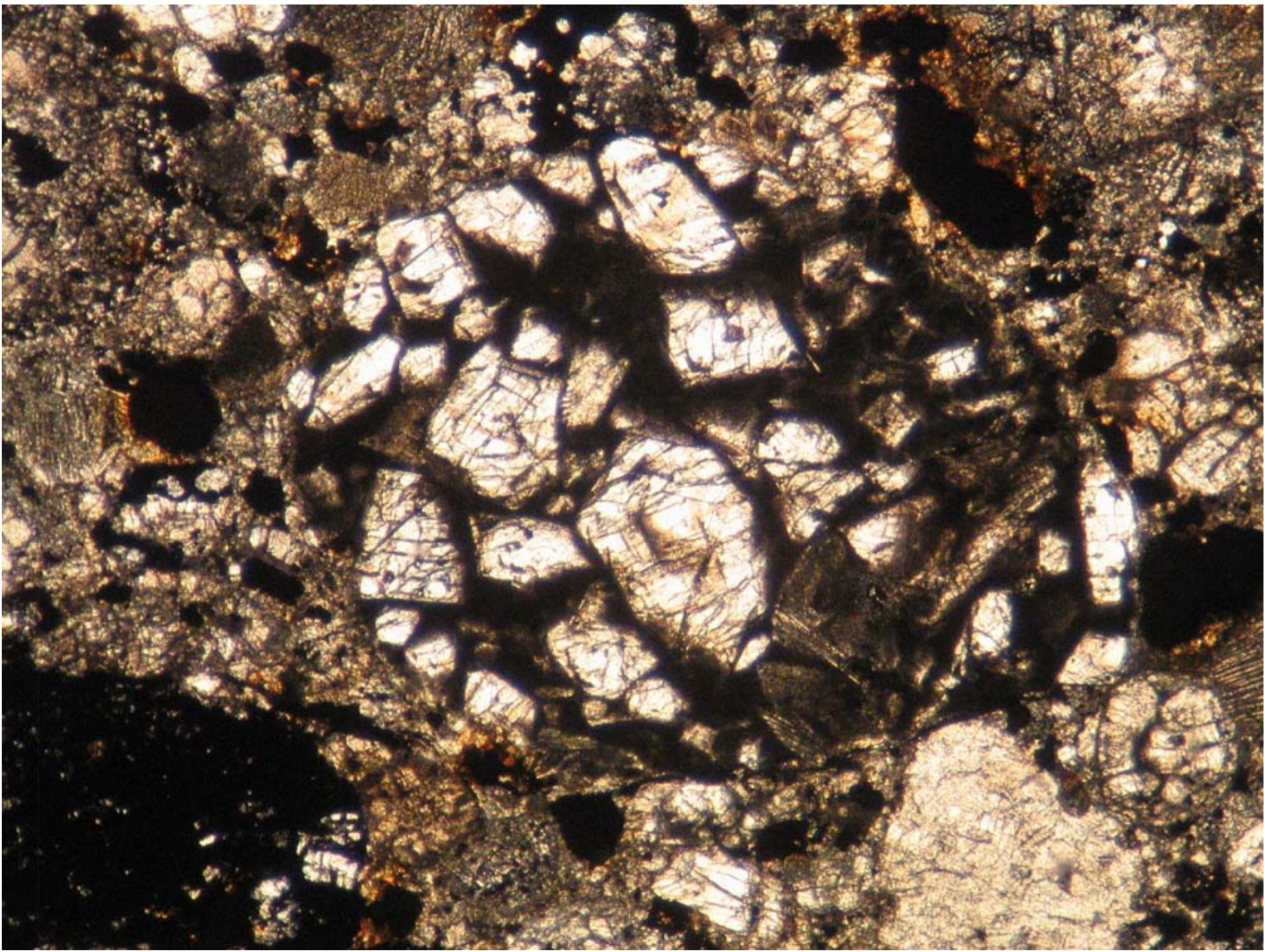
Radial pyroxene chondrule with fine laths. Diameter~1.2mm. PPL.



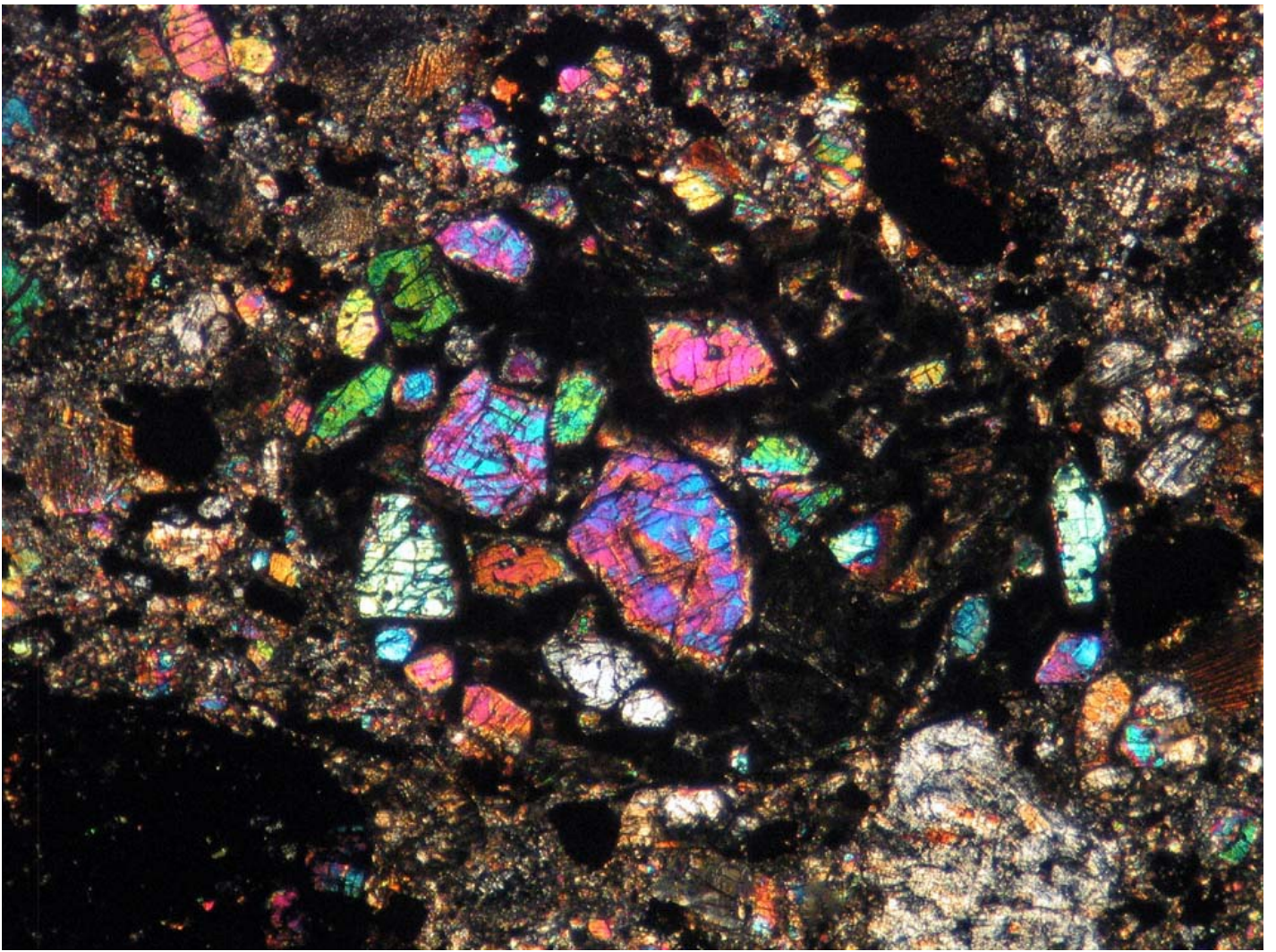
Radial pyroxene chondrule. Diameter~1.9mm. XPL.



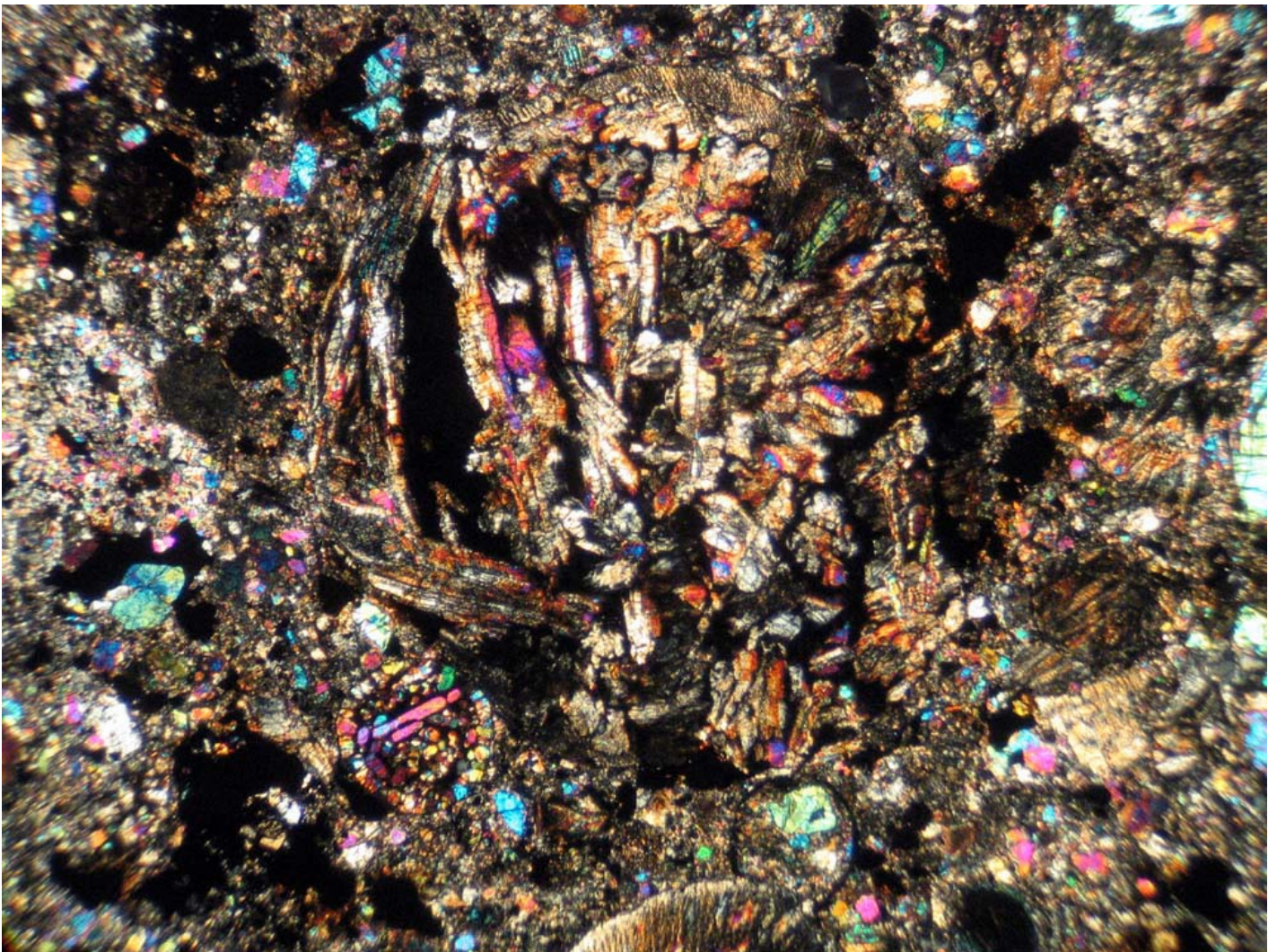
Chondrule in center with brownish glass mesostasis.



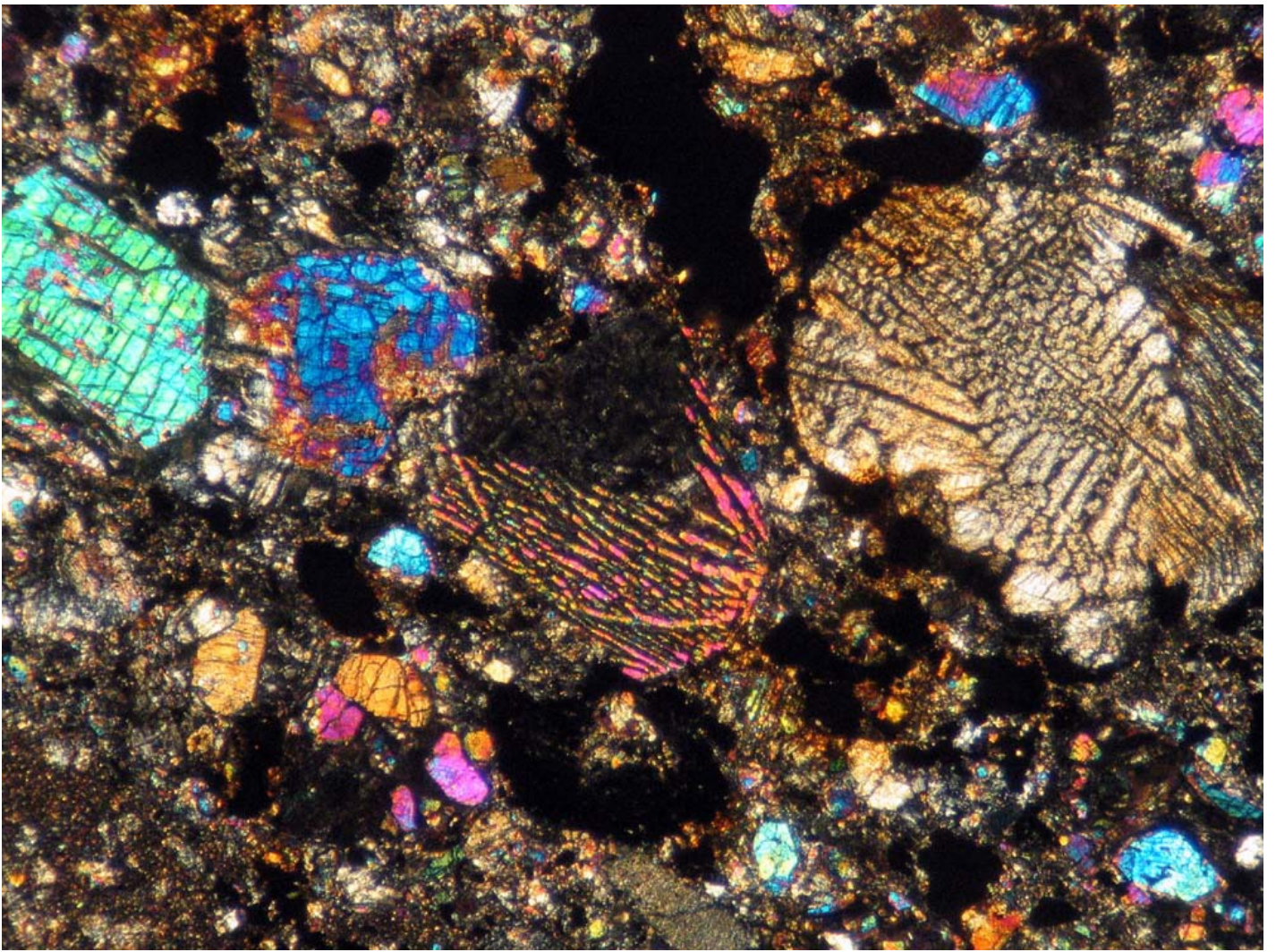
Closer. FOV=3.1mm. PPL.



Same. XPL.



Contrasting size and chondrule types. The large central chondrule is 2.9mm in diameter. Off its edge at 7 o'clock is a colorful 0.7mm diameter chondrule with a neat shell of olivine grains. And at 5:30 o'clock is a 0.5mm diameter dust rimmed chondrule. XPL.



Contrasting textures. FOV=3.1mm. XPL.

Norm's Tektite Teasers: Thailandite Thermal Ablation Cores?

By Norm Lehrman (www.TektiteSource.com)

Thermal ablation effects are the hallmark of Australites. Nearly all show them in some variation. *Cores* form as the incandescently-hot frontal surface expands and flakes explosively detach from the sides and front. In the following image, the flight direction was towards the top. All are classic Australite cores with well developed flake scars.



A few reported examples of thermally-ablated tektites outside of Australia are known, but not many. With the fingers of two hands, you can count them all. Java, Billiton, and the southern Philippines account for nearly all of them. No examples have been reported from China or mainland southeast Asia. There seems to be a northerly limit to their distribution which remains unexplained

Over the years we have sorted through a few million tektites, and we have a good eye for special stones. In our special pieces drawer are two (and only two) suspect thermal ablation cores from Thailand, possibly the first such specimens ever described.



The three in the center of this image are Australite cores. The two to the right are Rizalite cores. The two to the left of the scale cube are Thailandites, the star of this article. Are they for real?

The sideview image above is the most instructive view. Let the Australite profiles serve to calibrate your eye. The general nose-cone like form is not entirely coincidental. Australite morphology was studied in the designing process for early spacecraft nose-cones.

Thermal ablation can also take the form of melt formation and migration under stable oriented flight conditions, as with oriented meteorites. I believe the Thailandite specimens are frontal-fusion thermal ablation cores (if they are actually cores at all). For any who would ponder their significance, we have to consider their extreme rarity. For some reason this sort of nose-cone fusion almost never happened.

The less glamorous and more probable explanation is that these are deeply telescoped hersheys-kiss style tear drops that have almost fully re-engulfed their tails. An accidental coincidence of form.

Another Tektite Teaser.



Front if a core, tail if a teardrop.



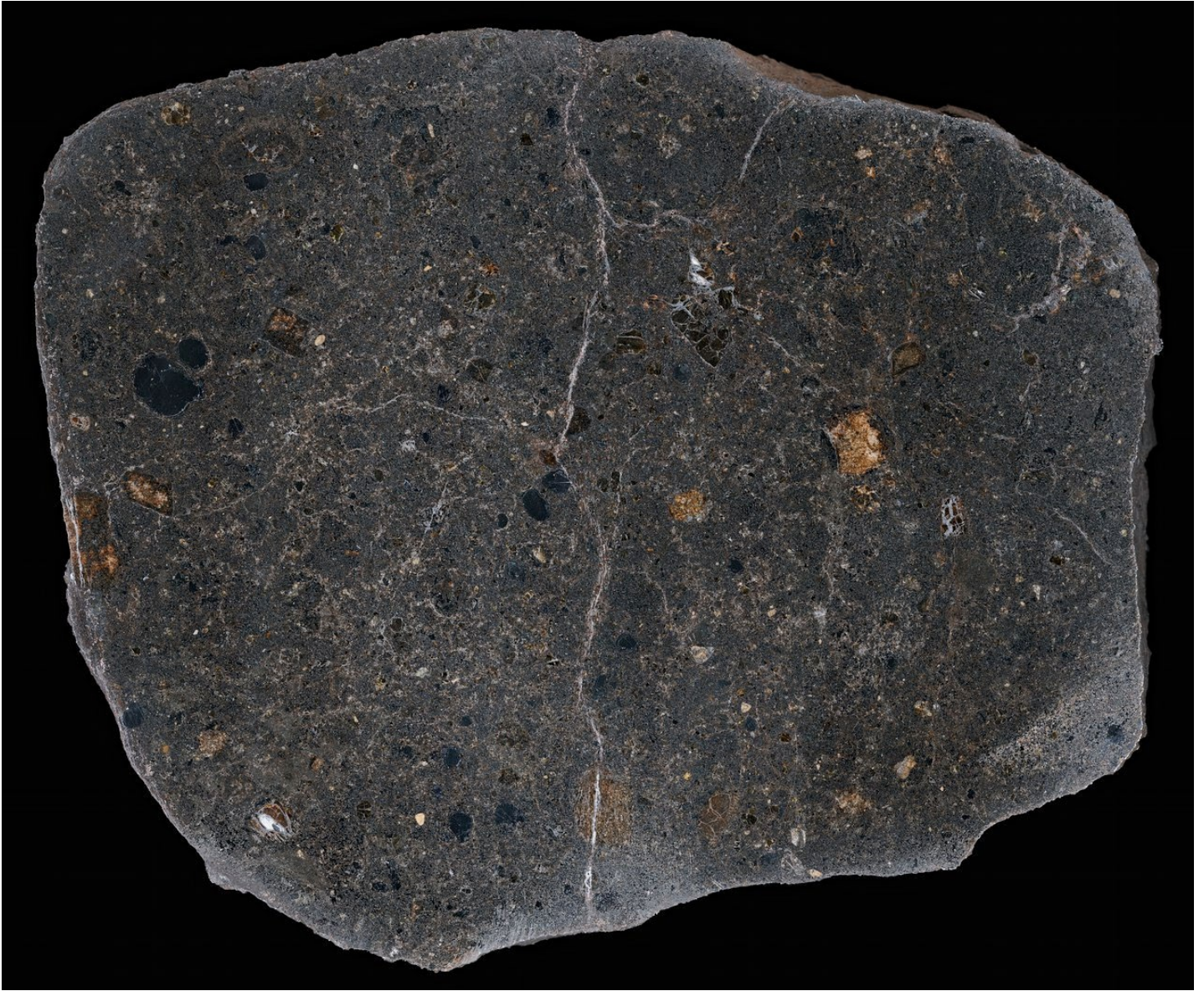
Tail if a core, front if a teardrop.

Meteorite Times Magazine

Vaca Muerta Mesosiderite A-1

Paul Harris

Our Meteorite of the Month is kindly provided by Tucson Meteorites who hosts [The Meteorite Picture of the Day](#).



Vaca Muerta Mesosiderite A-1 contributed by Holger Pedersen.

Meteorite Times Magazine

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Paul Harris

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*Once a few decades ago this opening
was a framed window in the wall
of H. H. Nininger's Home and
Museum building. From this
window he must have many times
pondered the mysteries of
Meteor Crater seen in the distance.*

Photo by © 2010 James Tobin