

MICROSCOPICAL EXPLORATION TWENTY

Abstract Art à la Acetaminophen

For ME20, my first of 2023, I re-visit one of my favourite subjects for observation under polarised light, Acetaminophen, or as it is more commonly known here in the UK, Paracetamol.

This substance is widely and easily available, sold as an analgesic and anti-pyretic medicine, and is fairly innocuous in small amounts. As a test subject for microscopical observation, it is soluble in readily available solvents such as ethyl ethanoate (formerly known as ethyl acetate) and propan-2-one (acetone), both of which are sold in fairly pure form as nail polish removers.

The preparation of paracetamol crystal slides by evaporation from solution in either of these solvents is simple due to the volatility of both. I tend to favour ethyl ethanoate because, to my nose, it has a nicer smell.

(DO NOT SNIFF ANY SOLVENT UNNECESSARILY).

Follow the link below for guidance on crystal slide preparation:

[Preparation of Crystals for Observation](#) (Robert Pavlis, *Micscape*, August 2007).

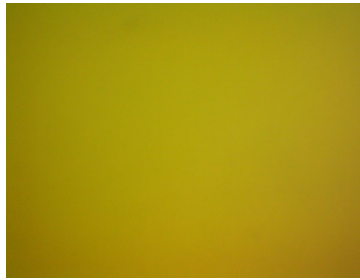
Now I come to optical waveplates or retarders, which I have used in previous microscopical explorations, where I have been quite vague regarding their construction and effect. That said, the physics of optical retarders is beyond the scope of this exploration but for those interested, see the [Wikipedia](#) entry.

My set of homemade waveplates was made by applying layers of unbranded clear sticky tape to four clean glass microscope slides as follows:

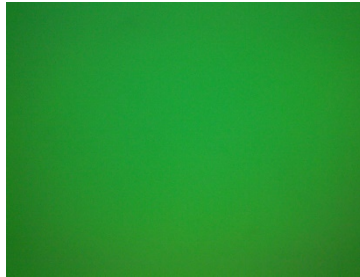
1. One layer applied longitudinally.
2. Two layers applied longitudinally one on top of the other.
3. Three layers applied longitudinally on top of each other.
4. Four layers applied longitudinally on top of each other.

These waveplates, when placed in the lightpath of my microscope immediately above the condenser and between the polarising and analysing filters, give rise to the background colours shown in the four images below:

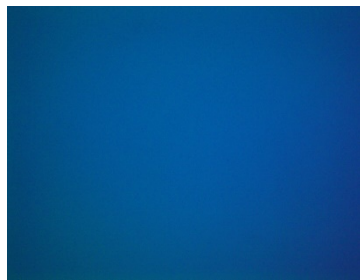
1.



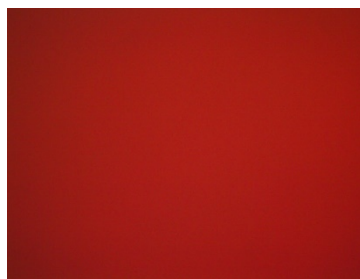
2.



3.



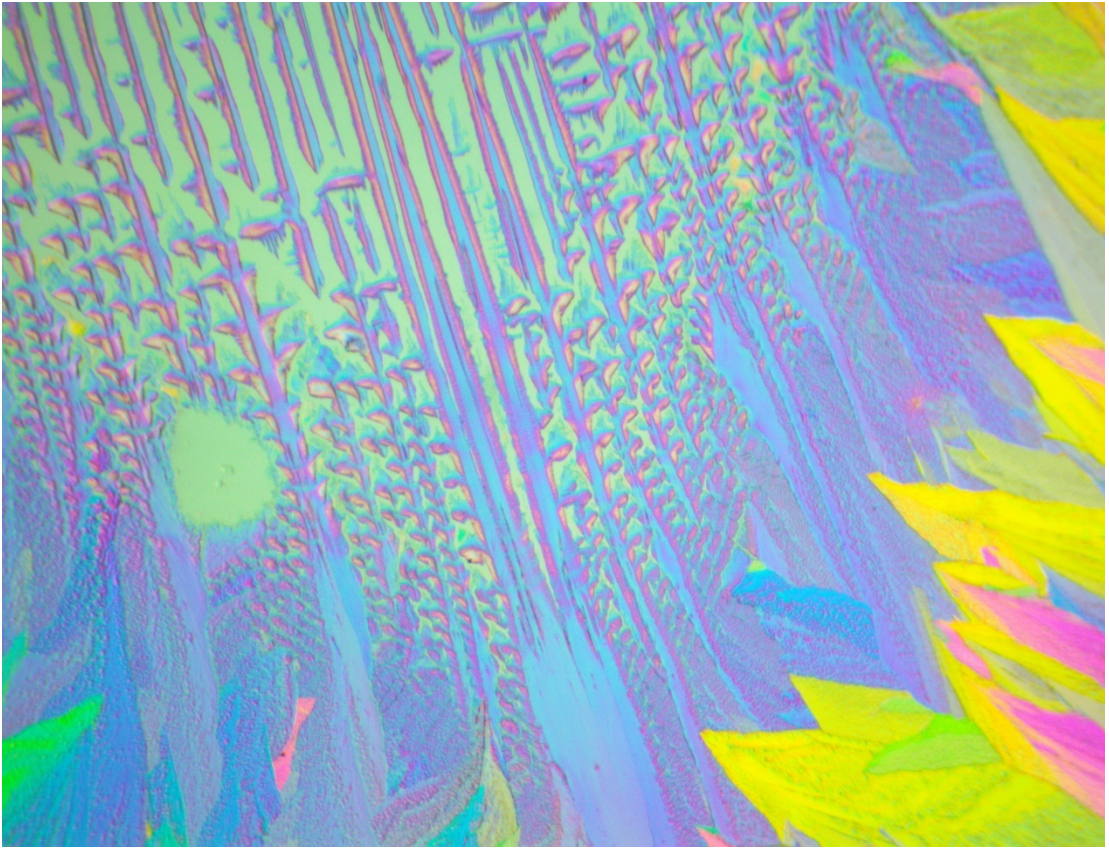
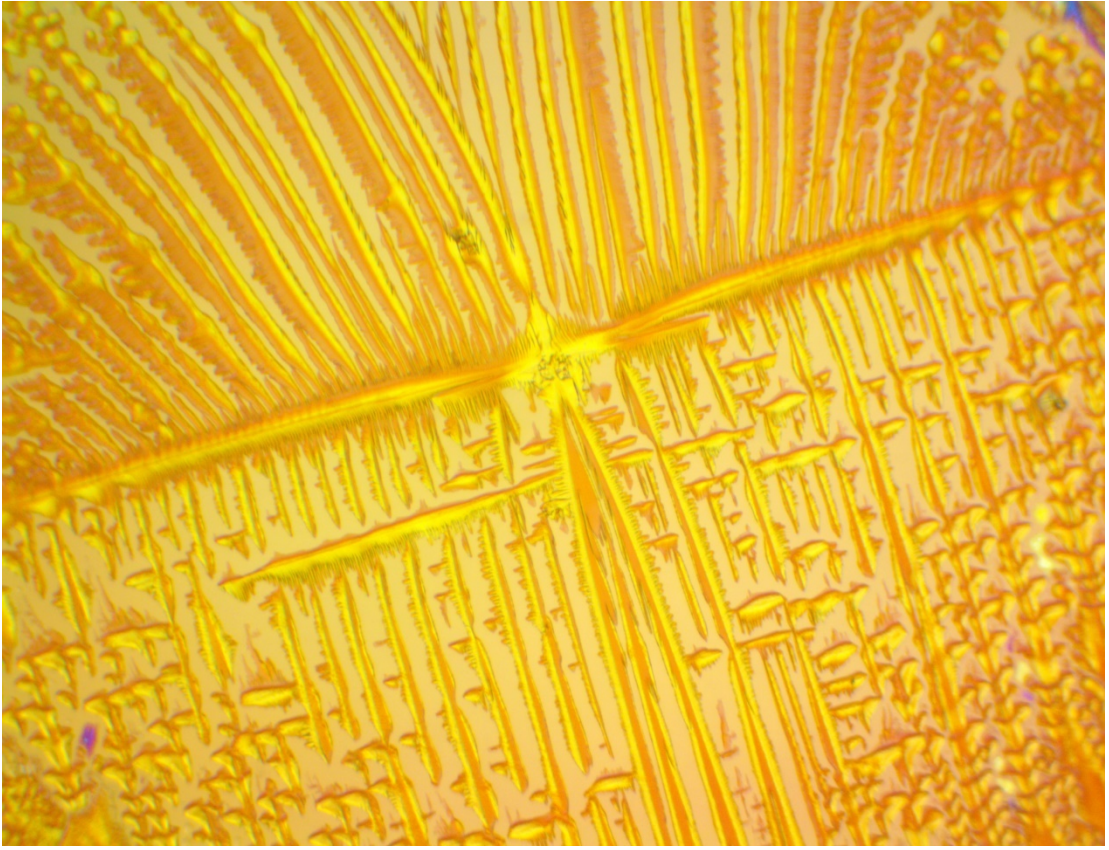
4.

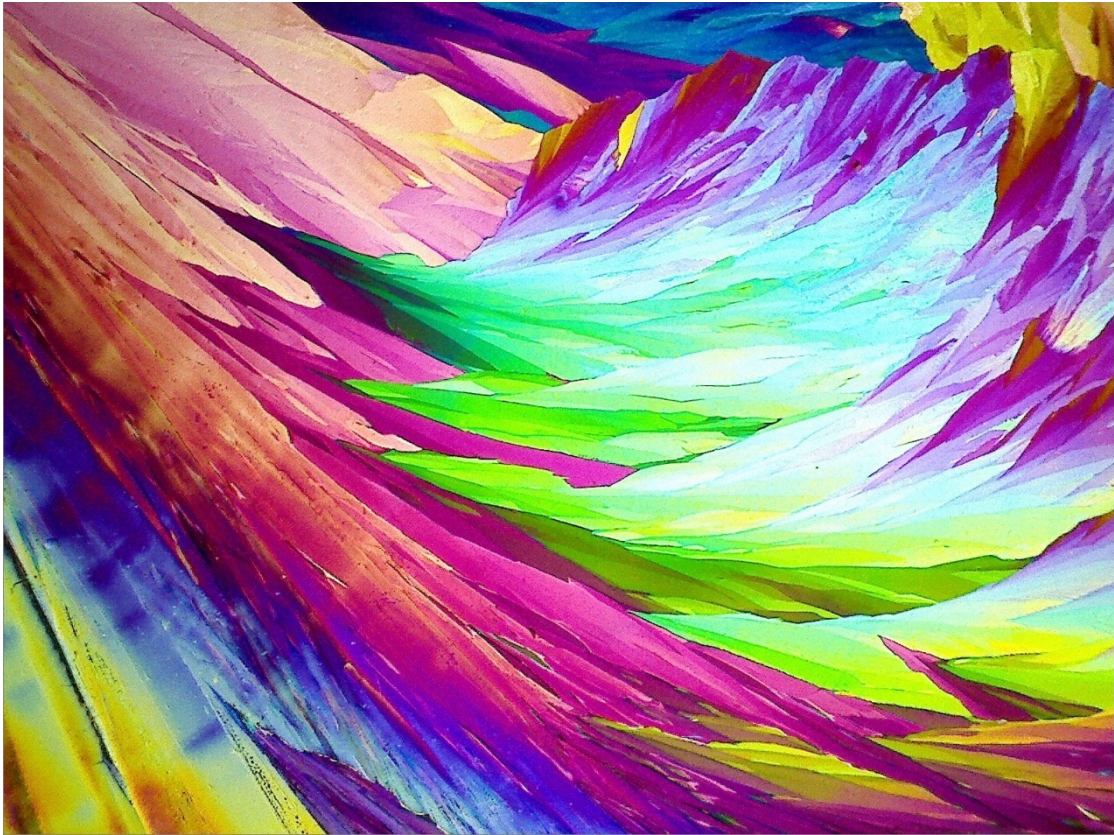
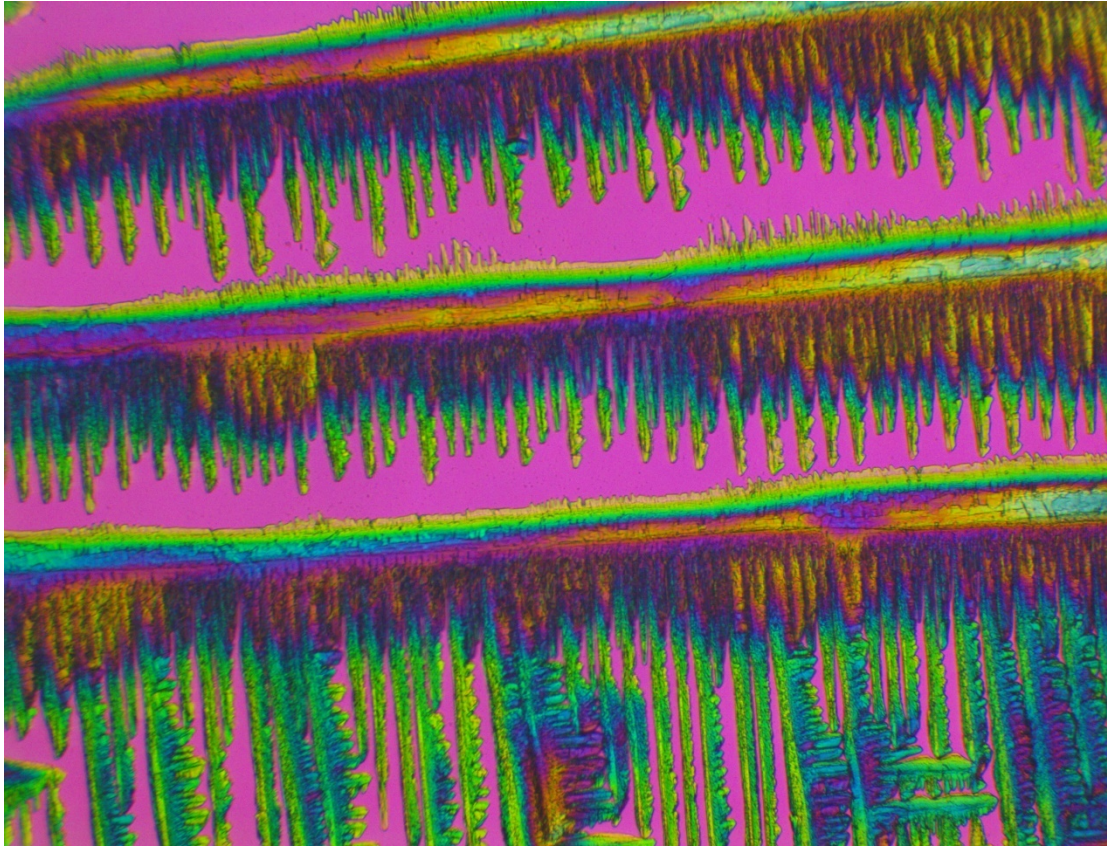


I refer to the waveplates as my yellow, green, blue and red plates respectively, and when used to add their effect to observation of crystals of acetaminophen (paracetamol) between crossed polars, the results can be spectacular and give rise to images well worthy of the designation 'Abstract Art'.

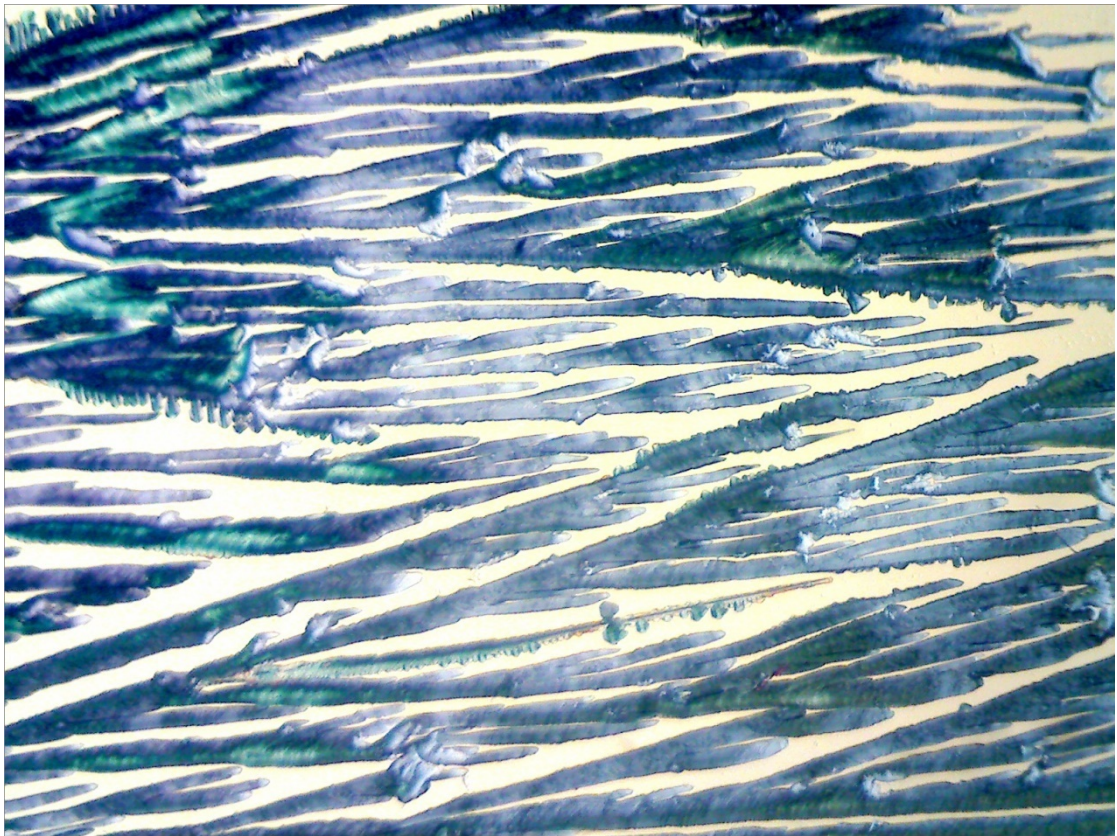
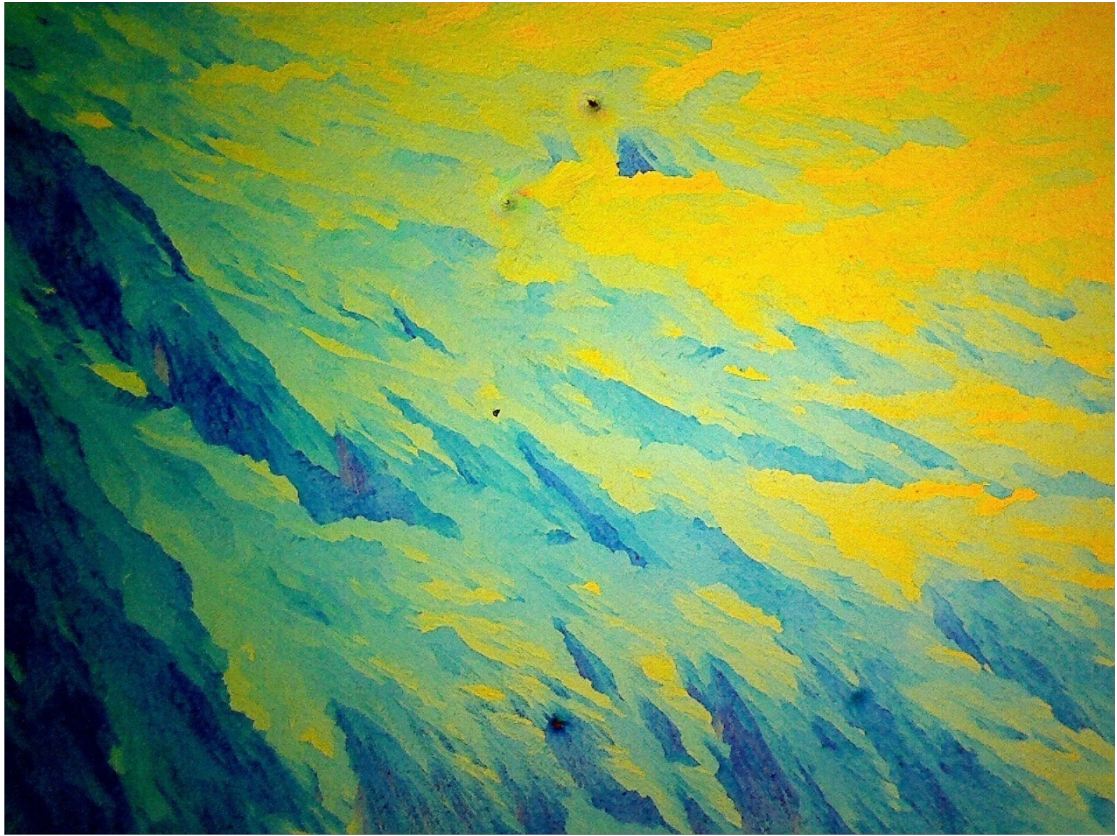
Here are a few examples:

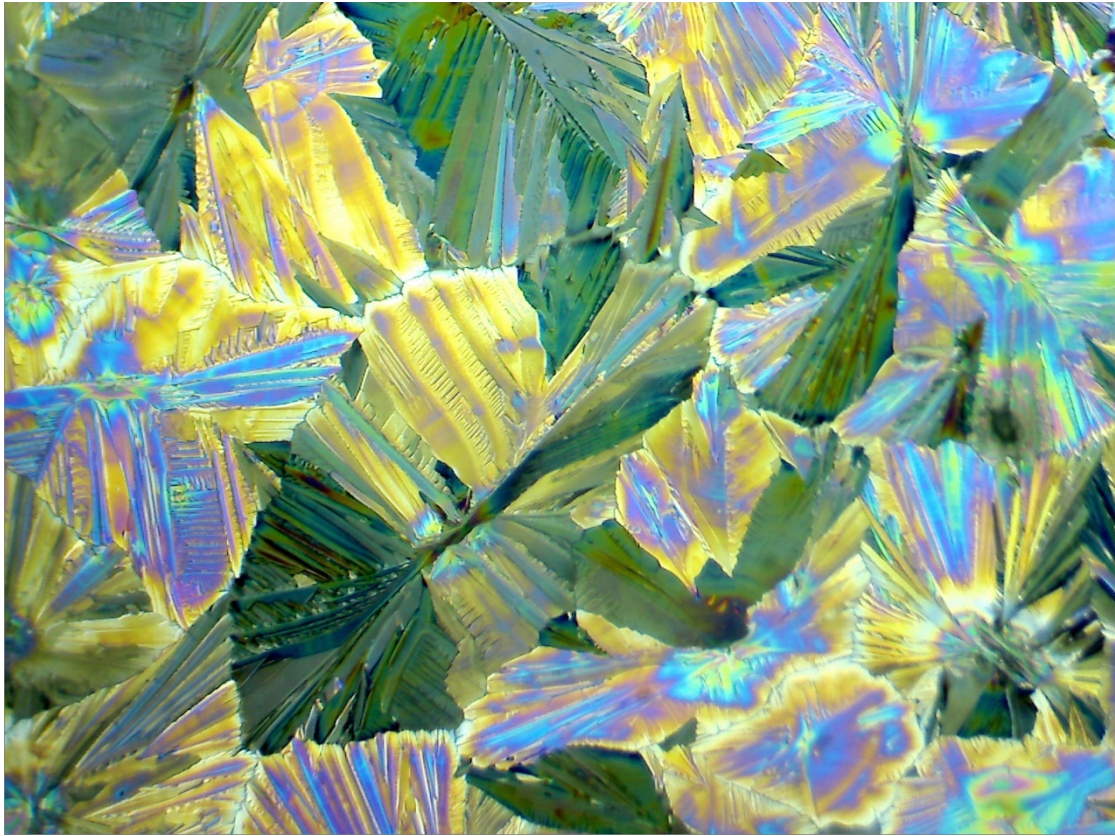












I make no attempt at any interpretation of, or assignation of meaning to, any of these pictures: they stand on their own merits. I do, however, derive enormous pleasure and satisfaction from making the observations and capturing the images.

Appendix on next page.

APPENDIX TO MICROSCOPICAL EXPLORATION

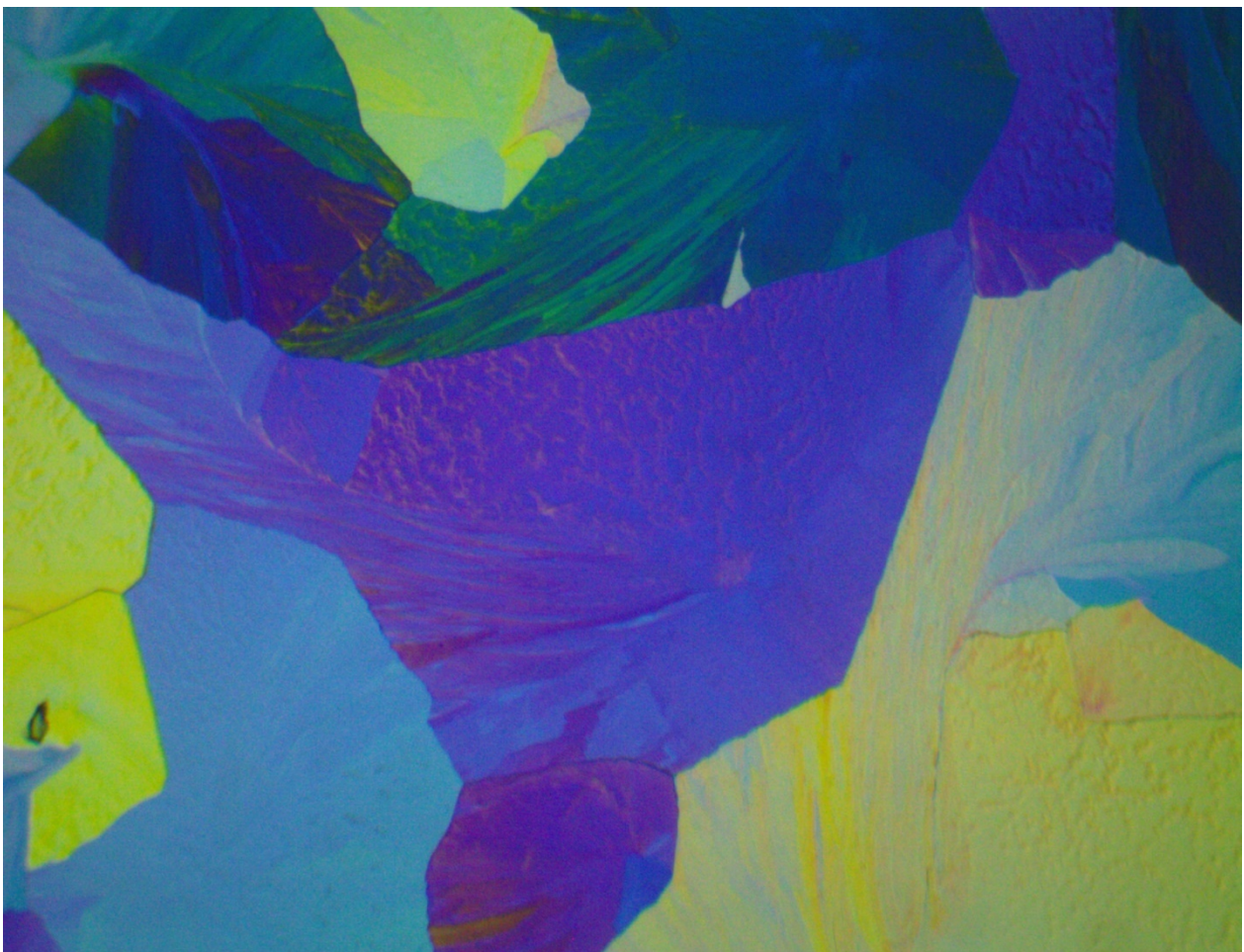
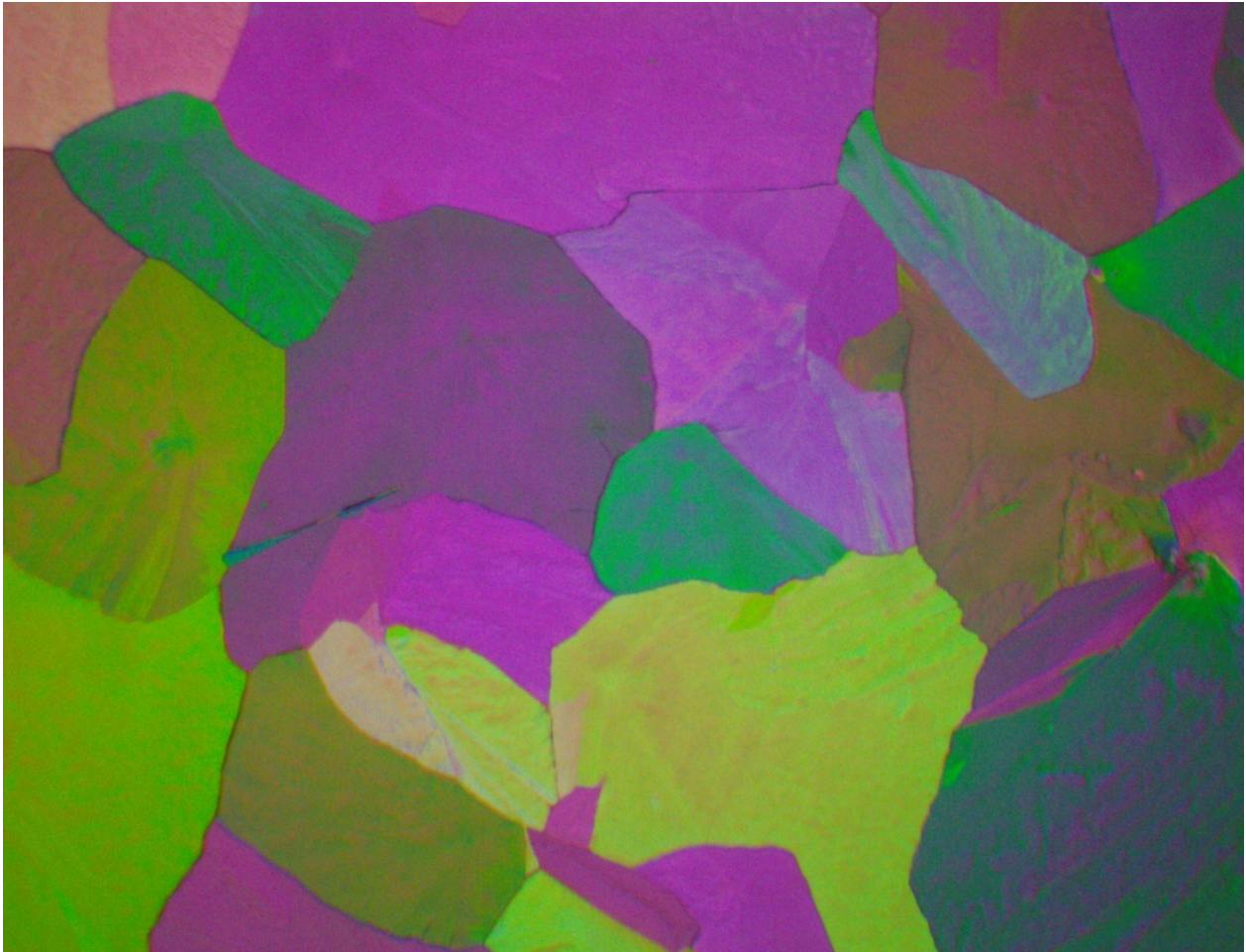
TWENTY

MORE ABSTRACT TART_{ARIC}

In this short appendix to ME20, I turn my attention to my second favourite subject for polarised light microscopical observation, Tartaric acid. The slides were made in the same way, from solution in Ethyl ethanoate, and the same sticky tape waveplates were used in the observation and capture of the images below.









Once again I make no attempt at any interpretation of, or assignation of meaning to, any of these pictures: they also stand on their own merits. I do, however, still derive enormous pleasure and satisfaction from making the observations and capturing the images.

As we say here in Cumbria:

‘Ave a go yersel’!

Comments please, to:

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