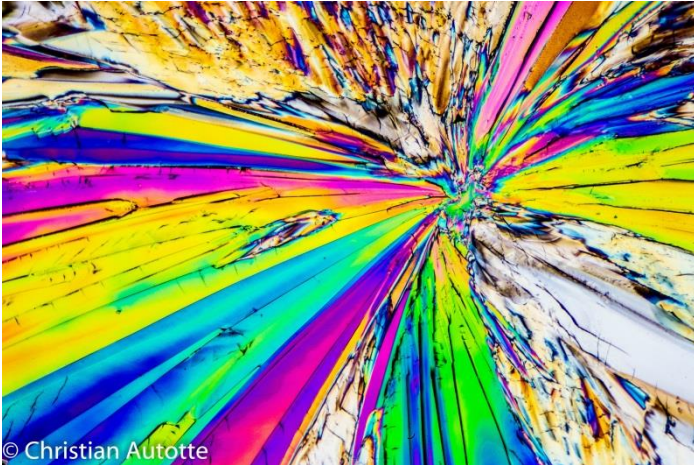


# IN HOUSE MICROSCOPY

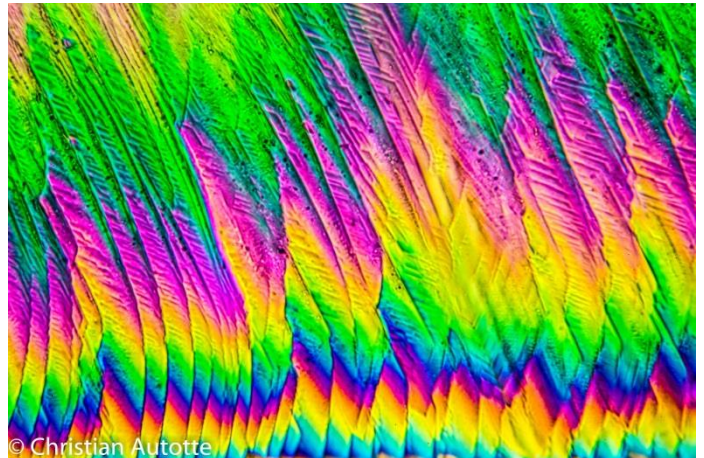
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With the pandemic forcing many people indoors again, we are all looking for things to keep busy. Those with microscopes may have an advantage over many others.

During the warm season we could investigate the extremely small in nature, like micro-organisms in ponds, lakes, and sea shores. But in mid-winter these sorts of subjects can be more limited or difficult to access. So what about things around the house?

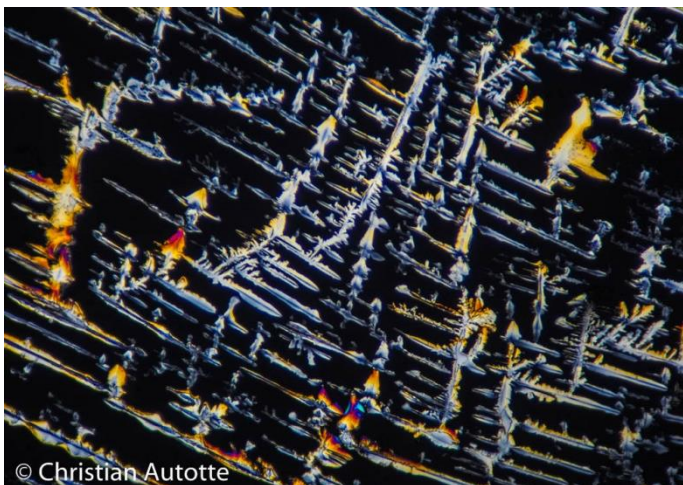


© Christian Autotte  
White sugar crystals, 40x, polarized light



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Amaretto crystals, 400x, polarized light, stack of 6 pictures

A popular type of subjects for Micscape readers and writers has always been crystals photographed in polarized light. A surprising numbers of products found around the house can produce interesting and colorful patterns that can be studied and photographed. In my case, it ranges from plain white sugar to some alcoholic beverages like Amaretto, to various medications, like aspirin, wart removers, and so much more. It's worth experimenting, dissolving the products in water or alcohol and see what comes out. I have even got intriguing patterns from the red juice dripping from red meat. I expected getting a smear of red blood cells; instead I got spreading tree-like patterns of colorful crystals. I have no idea what they are made of...



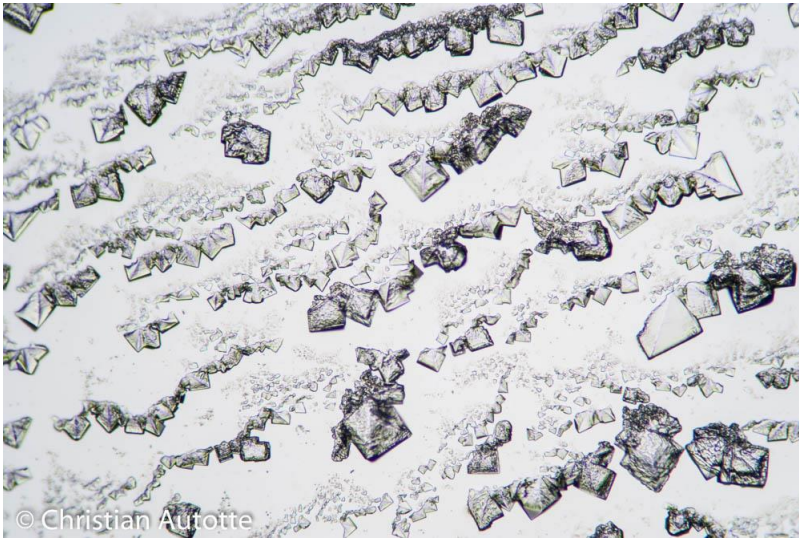
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Tylenol crystals in alcohol, 70x, polarized light



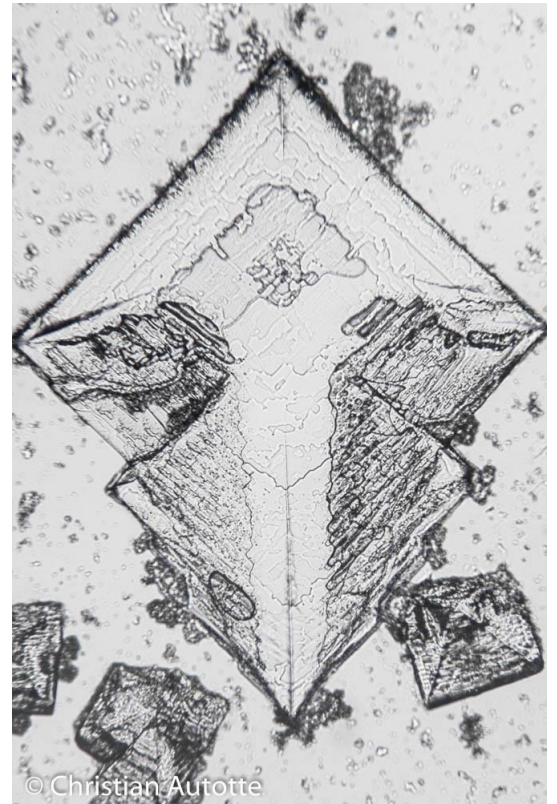
© Christian Autotte  
Beef juice crystals, 100x, polarized light



Next are classic subjects to be investigated with a microscope. Sugar and salt crystals come to mind. Try looking at them directly from the sugar bowl or the shaker, to see their crystals. An alternative is to dissolve them (as you would to make birefringent crystals) and allow them to recrystallize on a slide kept in a dust-free environment. The result can be surprising.



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Epsom salt, recrystallized, 100x

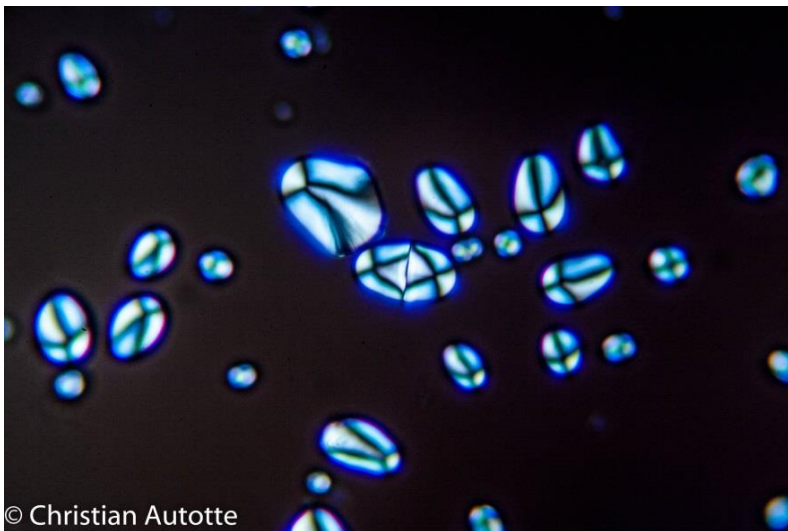


© Christian Autotte  
Salt, recrystallized, 100x

In the kitchen, there are several other classics that are worth a look. Scrape off some pulp from a potato and spread it on a slide; polarizing light will reveal its starch. With some care it's also possible to make thin slides of carrots, celery, and any other fruits or vegetable you may have in your fridge; having a hand microtome would be an advantage, but it's possible to get acceptable results without it. All you really need is a *really* sharp blade, the ideal being a razor blade. You may color the specimen with methylene blue or even experiment with food colorant; the most fortunate may have eosin or toluidine blue or other stain at their disposal.



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Carrot cross section, 200x, toluidine blue staining

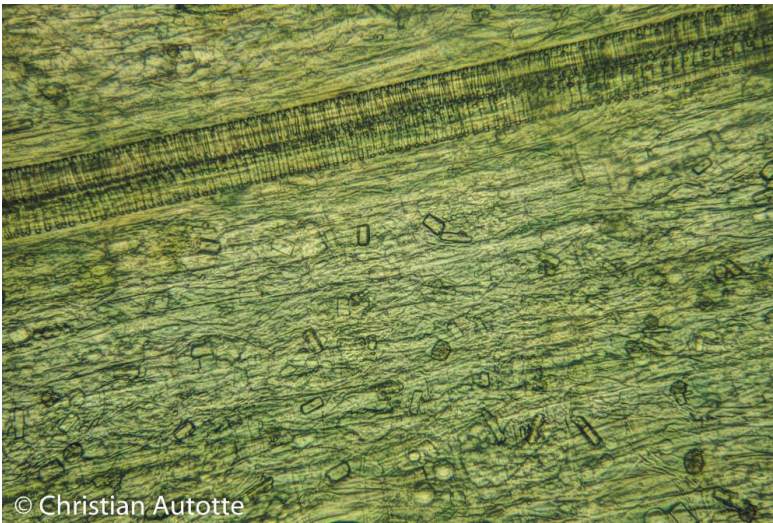


© Christian Autotte  
Potato starch, 400x, polarized light



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Celery cross section, 100x, methylene blue staining





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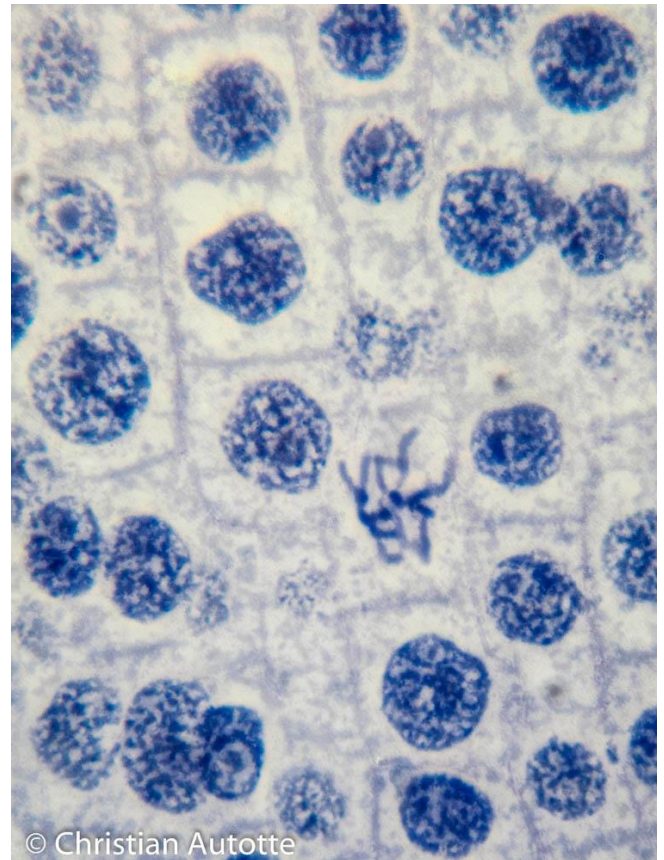
Leek, no staining, 200x, stack of 23 pictures.

Who could forget that classic of microscopy: the onion skin? Every commercial kit of prepared slides includes a piece of it. But have you tried to peel some of it yourself? That could be the right excuse to do some experiments, coloring the cells with various stains and see what comes out.



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Onion skin, stained with toluidine blue, 200x



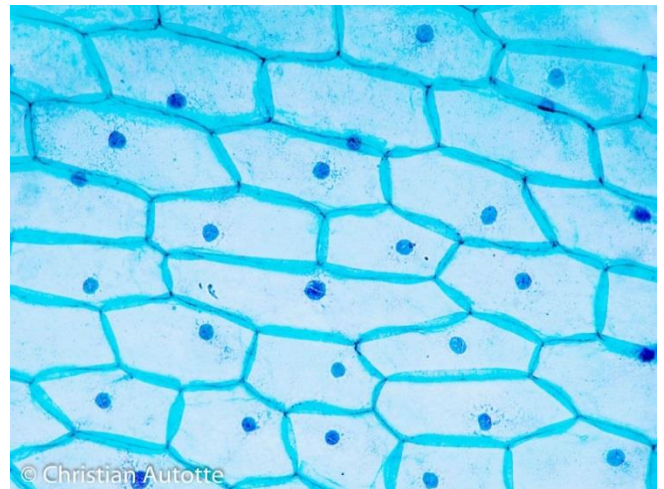
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Onion root tip from a commercial set. 1000x



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Onion skin, commercial slide, 100x



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Onion skin, commercial slide, 100x





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Peace Lily Stem, cross section, 100x, colored with toluidine blue

While we're talking about plant matter, house plants should not be neglected. Whole leaves are interesting, but so are cross sections of stems. If there are flowers, take a look at the pollen.



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Peace Lily pollen, 400x



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Peace Lily flower



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Indoor house vine



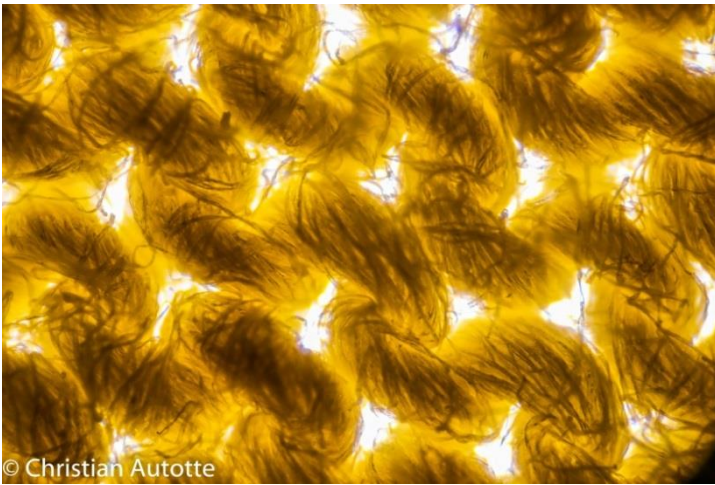
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Indoor house vine, edge of leaf, 100x, stack of 7 pictures

A house vine examined at high magnification revealed surprising thorns at the edge of its leaves.

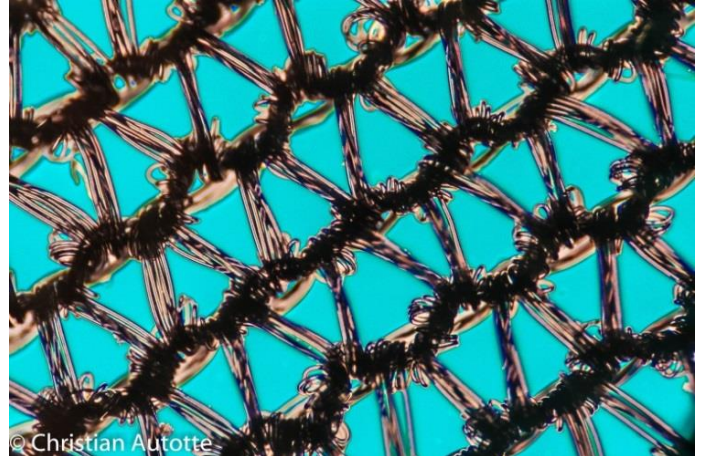


Rummage through your drawers. Sweaters, T-shirts, socks, nylon stockings, all these can be very interesting when examined at low to medium power. We can examine the weave but also the individual fibers of the textile that makes them. Other forms of “textiles” can also be of interest, such as any kind of paper or cardboard.



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Yellow cotton T-Shirt, 40x



© Christian Autotte

Nylon stocking, 40x, Rheinberg lighting



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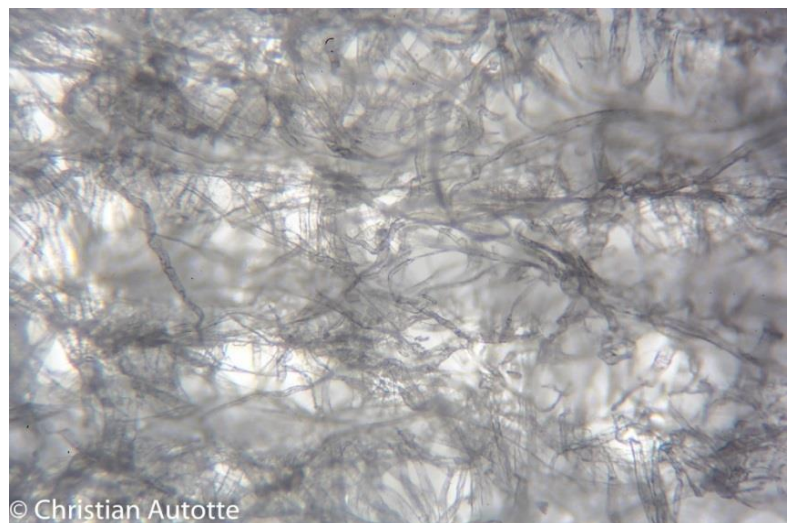
Microfiber cloth, 100x



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Bath Sponge, 40x, stack of 6 pictures

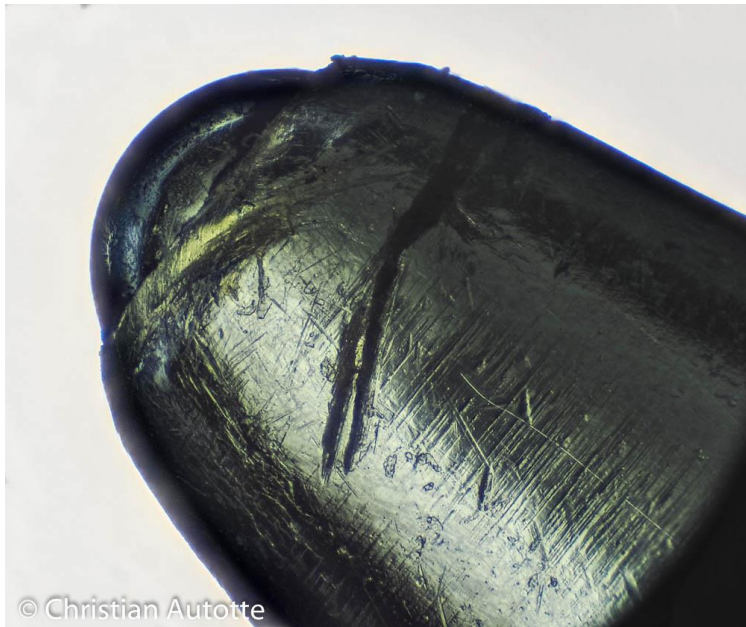
Bathrooms also include some items of interest. We've already mentioned crystals grown from various medicines. Take a look at sponges, toilet paper, Epsom salts. Some toothpaste may be interesting, but mine did not yield anything worthy of a picture.



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Paper tissue, 100x

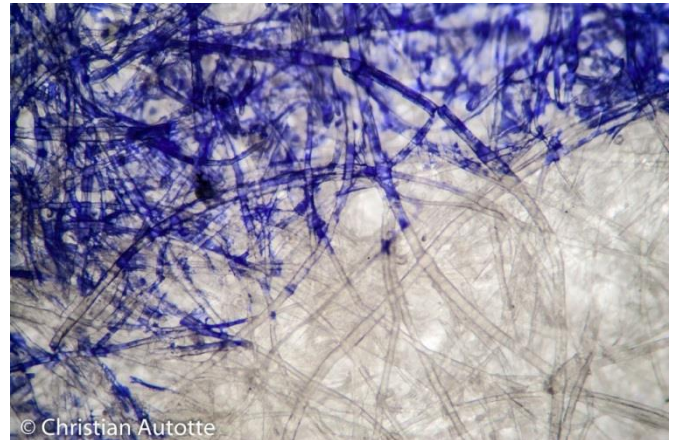




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Ballpoint pen, about 20x, stack of 36 pictures

In the office or den, you can investigate common objects like pens or writing on plain paper. If you happen to have some old LPs, a look at the grooves is another classic microscopic subject for investigations. This kind of subjects may require special techniques and some post-producing to get decent pictures; if anything that should make for some great exercises.



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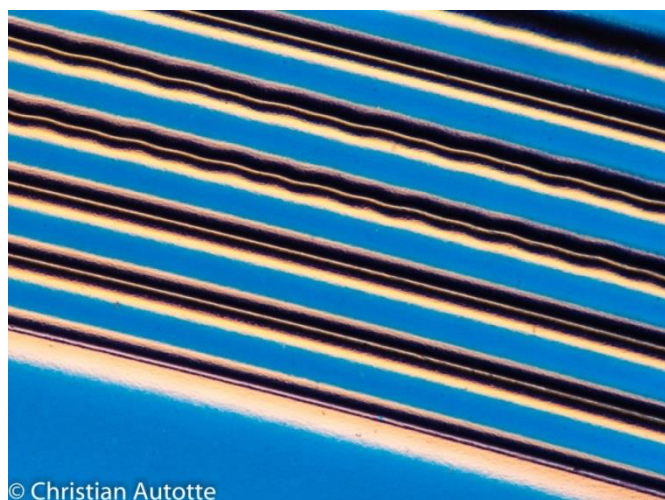
Ink signature on plain white paper, 400x



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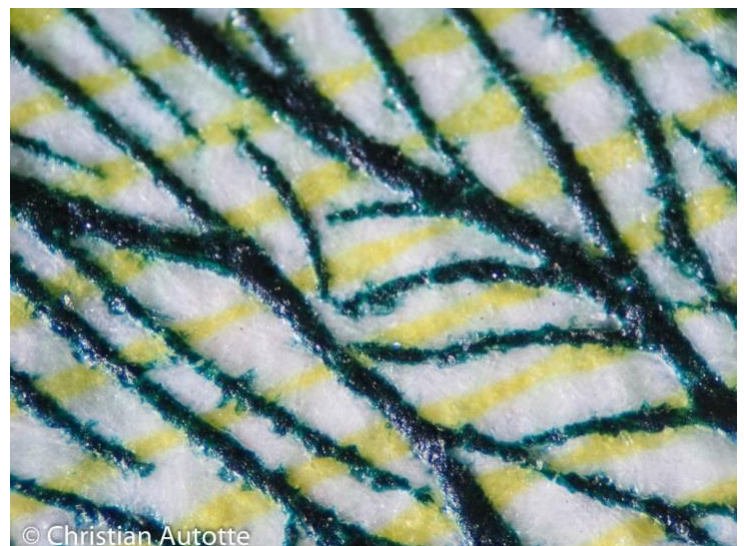
Picture in magazine, 40x

Photos in magazines show all the dots making the image. On the other hand, printed currency looks very different; the ink making up the image looks three dimensional, a fact that can be verified when one rubs the paper between thumb and finger. Stamps don't have the same "safety features" and look just like pictures in magazines.



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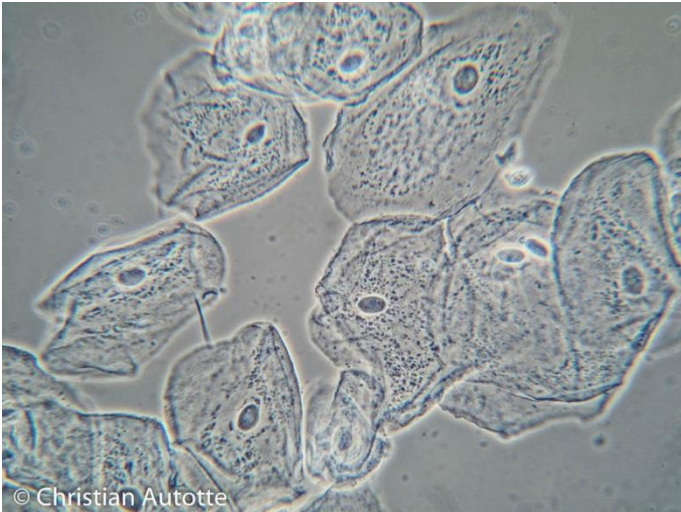
Old vinyl LP, 40x



© Christian Autotte

South African 10 Rand, 40x



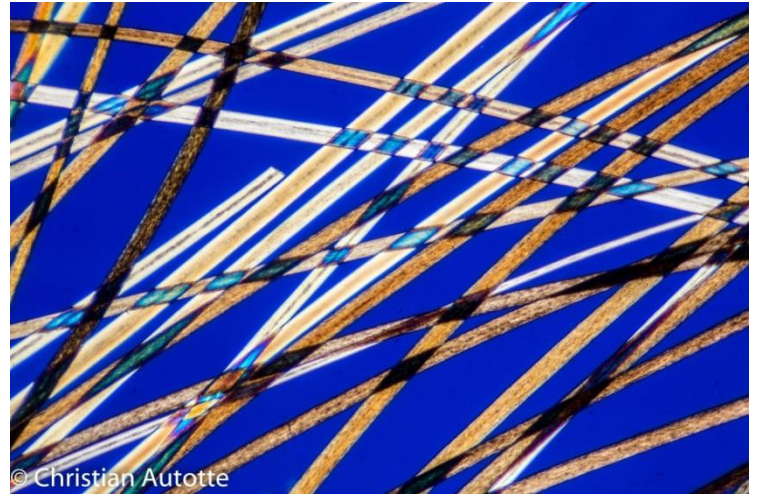


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Epithelial cells, 200x, phase contrast

A lock of hair or beard whiskers are also interesting. Try looking at them in polarized light. If you're turning grey, as I do, you will see the difference between pigmented hairs and those that have lost their pigmentation. But what would you see if the hairs were colored or bleached?

And what about investigating the inhabitants of the house themselves? Epithelial cells are collected by scraping a toothpick inside your cheek; something you may have done at school if you studied biology. They really stand out if observed with a phase contrast microscope; otherwise a filter for oblique lighting may make them stand out just as well.



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Brown and grey hairs, polarized light, 40x



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Dog hairs (pug), polarized light, 100x

Are you the only inhabitant of your house? What about dogs, cats, or parakeet? Hairs and feathers are always popular, either in plain white field or in polarized light.



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Domestic finch feather, 100x

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