From Eye to Insight

Leica
MICROSYSTEMS

# POWER UP ROUTINES WITH EFFICIENCY AND COMFORT

Visoria P polarization microscope

# VISORIA P POLARIZATION MICROSCOPE

Experience enhanced efficiency and comfort in your daily microscopy routine. The Visoria P polarization microscope uses polarized light to study the optical properties of materials and geological samples.

Streamline your workflows with encoded functions, optimized light settings, and other microscope features. You can also be more comfortable and minimize strain thanks to the microscope's ergonomic design.

# VISORIA P DIGITAL POLARIZATION MICROSCOPE

The Visoria P digital laboratory microscope without eyepieces offers a number of practical benefits.

**Work without eyepieces by going digital**

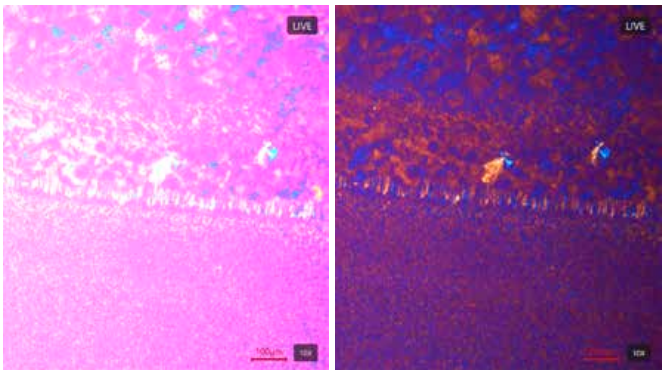
- Work in a comfortable and relaxed position by viewing images directly on a tablet.
- Visualize and document your work steps quickly and discuss image results easily with your colleagues.
- Save space on your workbench without the need for a computer.

# EFFICIENCY THROUGH ENCODED FUNCTIONS

Increase the efficiency of your routine microscopy tasks. Save valuable time with simplified documentation and encoded microscope functionality, allowing you to focus on your sample.

### Save time with optimized light settings

Spend more time viewing and examining samples with Visoria P. If you change the microscope's magnification or contrast method, there is no need to manually adjust the brightness thanks to the light management function. The illumination settings are automatically applied thanks to the microscope's encoding.




Observe samples with optimal illumination: Left image taken without and right one with the light management function.

### Simplify your documentation

You can quickly capture sample details with a press of a button while keeping your eyes on the image. The button for image acquisition is easily accessible on the Visoria P microscope stand.

When you store an image for documentation, selected system settings are automatically saved along with the meta data of the image.

The scale bar is automatically adjusted and added to the image which increases efficiency and saves you valuable time.


Save time and effort by snapping your image with a press of a button on the microscope stand.

### Operate your microscope with ease

Perform daily routines rapidly and reliably thanks to the intuitive operation of Visoria P.

- Easily find the appropriate aperture diaphragm settings for the objective used by matching the color markings.
- Protect your samples and objectives from accidental damage with the built-in focus stop.
- For finer focus at higher magnification, use the three-gear focusing system - coarse, medium, and fine.


The aperture diaphragm's scale on the transmitted-light condenser has color markings matching the objective color codes.

# MORE COMFORT WITH ERGONOMICS

Work with a comfortable posture by taking advantage of the symmetrical positioning of controls and ergonomic accessories. These features help reduce neck and back strain, even during extended hours at the microscope.

**Stay comfortable while working**

Visoria P adapts to your needs, allowing a proper posture and reducing the risk of neck and back strain during long hours at the microscope.

Work comfortably with aligned shoulders and optimal hand and arm positioning thanks to the symmetrical layout and height adjustment of the focus control knobs.

Users can maintain a comfortable position while working with Visoria P.

**Adapt your microscope with ergo accessories**

You can maintain an upright posture thanks to the adaptability of Visoria P. Choose from a range of ergonomic accessories to suit your needs.

- **Ergonomic modules:** Insert ErgoModules below the tube to adjust the eyepiece height for a comfortable sitting posture.
- **Ergonomic lift:** The optional ErgoLift enables easy height adjustments of the microscope

You can bring the microscope eyepieces closer to your eyes by inserting an ErgoModule below the tube.

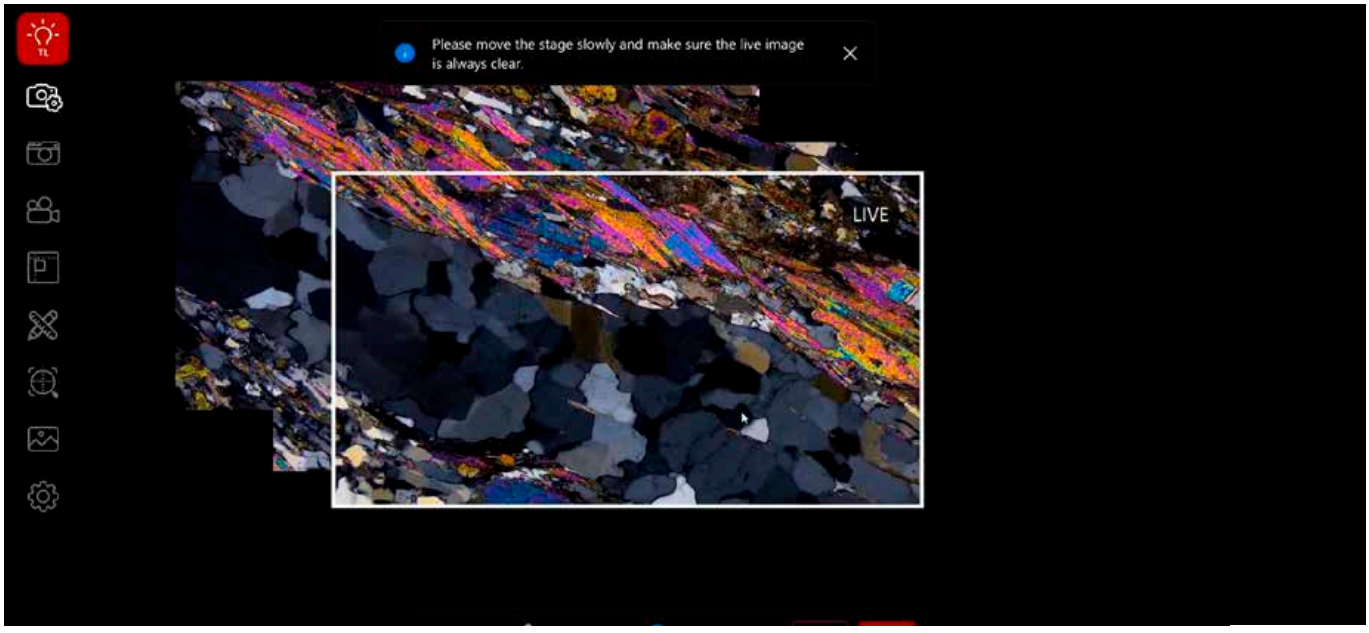
# POWERED BY THE ENERSIGHT SOFTWARE PLATFORM

Simplify and streamline your workflow with the Visoria P polarization microscope and Enersight software platform. It helps you compare, measure, and share seamlessly with a single intuitive interface.

**Key advantages:**

- Observe samples with a larger field of view and higher resolution using the XY Stitching with Manual Stage function.
- Acquire sharp images of samples with extended depth of field (EDOF).
- Capture images with optimal illumination and camera settings by using the Quick Brightness function.
- Optimize images by automatic correction of shading due to uneven illumination.
- Gain a better understanding of samples by merging multiple images from different contrast methods, such as brightfield and polarization.

Visoria P polarization microscope with Flexacam i5 camera and Enersight software.




A larger sample area with higher resolution can be observed using the XY stitching function.

# POLARIZATION MICROSCOPY AND ITS USAGE

The Visoria P polarization microscope employs polarized light to investigate the optical properties of birefringent materials.

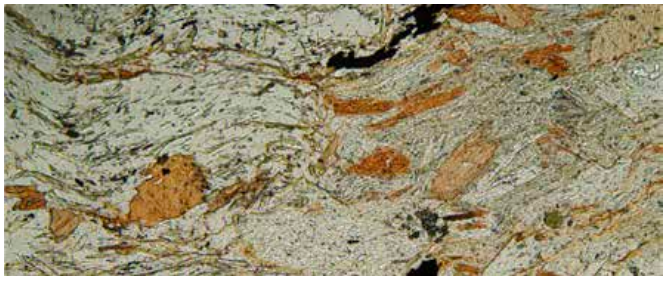
Essential components like low strain polarization objectives, nosepiece which provides individual centering for each objective, 360° rotatable stage, and specific compensators allow in depth investigations of a sample's optical properties and can reveal details that are invisible with non-polarized light.

Another technique, known as conoscopy, uses interference patterns to study the internal structure of crystals and allows the gain of further insights into their optical properties.

Polarization microscopy is widely used in fields like geology, material science, and biology to analyze minerals, polymers, and biological tissues.

**Parallel polarized light**

When the polarizer and analyzer are parallel, you can observe sample structures and characteristic colors.

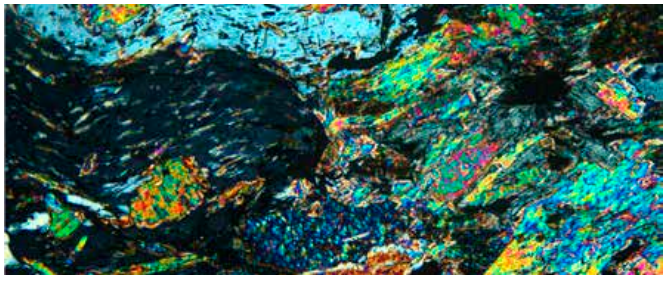


Thin section of geological metamorphic rock, 10x, parallel polarizers

**Crossed and circular polarized light**

When the polarizer and analyzer are crossed at 90°, it can help you identify birefringent materials.

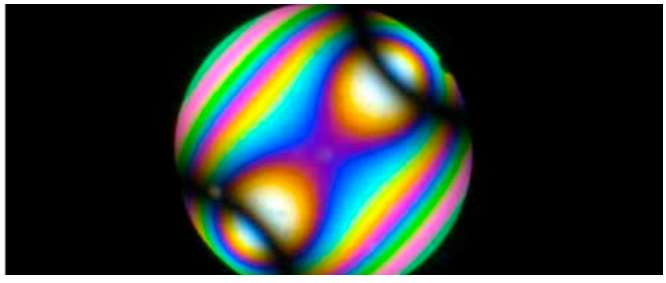
In some cases, it can be an advantage for the investigation of birefringent materials to use circular polarized light. It is produced by inserting quarter wave plates between the polarizer and analyzer.



Thin section of geological metamorphic rock, 10x, crossed polarizers

**Conoscopy**

During conoscopic observation, you can gain additional information about the internal structure and optical properties of crystals, for example, the number of optical axes, by analyzing the interference patterns.



Conoscopic image of bi-axial mineral with diagonal orientation

# DETERMINE OPTICAL MATERIAL PROPERTIES WITH CONOSCOPY

Visoria P delivers key results when investigating birefringent (optically anisotropic) materials like minerals, rocks, coal, plastics, polymers, liquid crystals, glass, and concrete.

Conoscopy is useful for evaluating the optical properties of anisotropic materials.

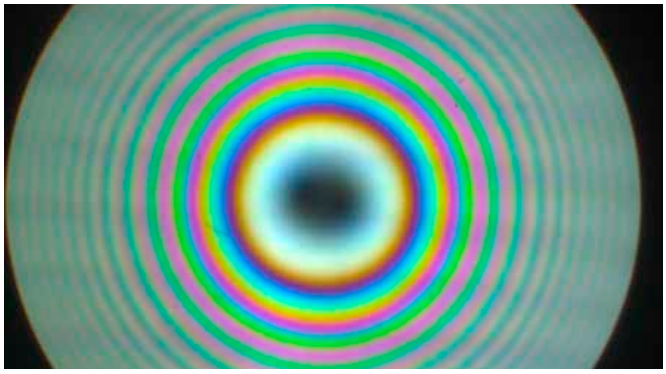
With the Visoria P, you can choose from three conoscopy modules:

- Bertrand lens cube
- Bertrand lens module (A/B module)
- Advanced conoscopy module.

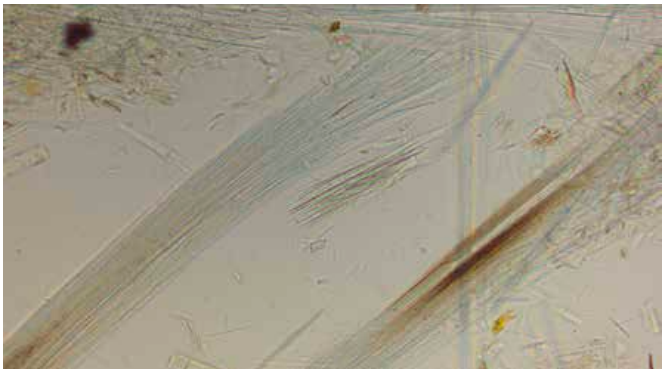
# SPECIALIZED OBJECTIVES FOR COAL AND ASBESTOS ANALYSIS

For the analysis of coal, Visoria P helps you to identify different sample components using specialized oil-immersion objectives.

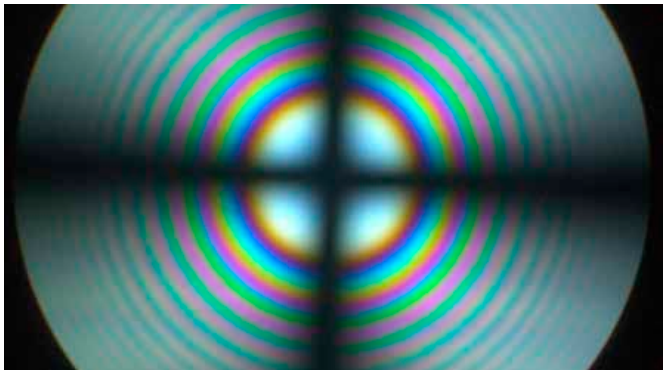
To determine the presence of asbestos in a sample, the dispersion color method is typically used. For this analysis, you can take advantage of the dispersion staining objectives.



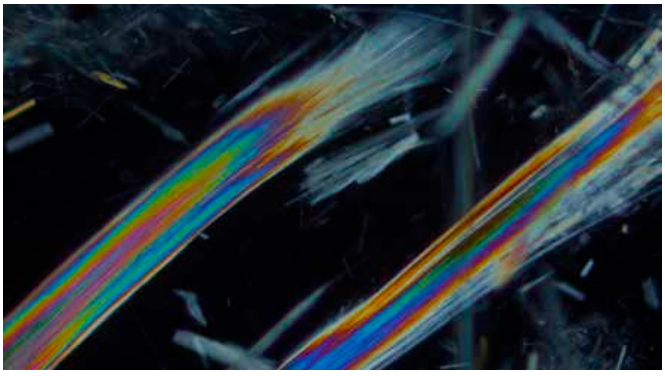
Conoscopic image of calcite with circular polarized light. The position of the optical axis can be clearly determined with circular polarization.



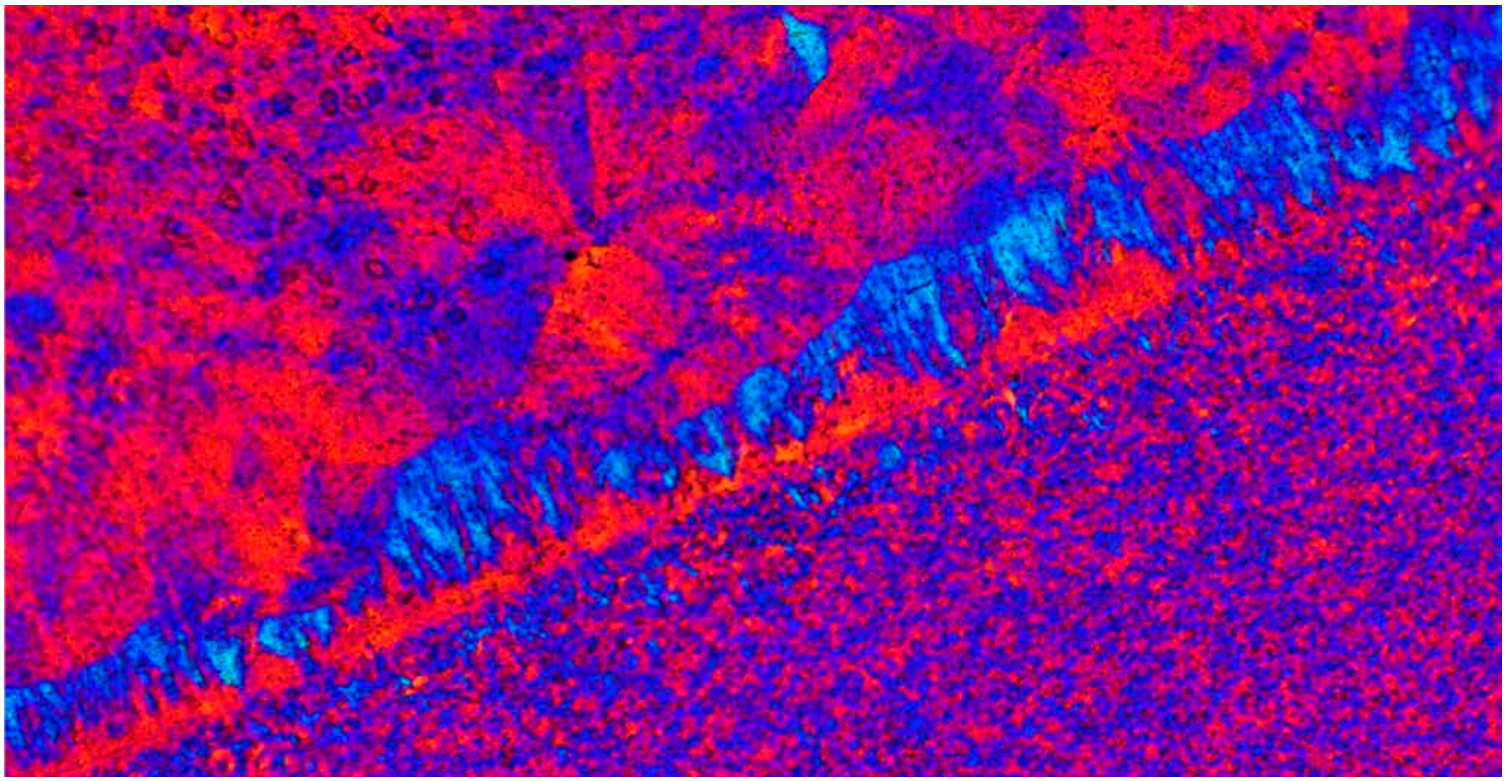
Fibrous actinolite imaged with parallel polarizers.



Conoscopic image of the same calcite sample with linear polarized light. The calcite section is perpendicular to the optical axis.



Same actinolite sample imaged with crossed polarizers. The actinolite fibers show prominent colors from birefringence which clearly distinguish them from glass fibers (no birefringence).

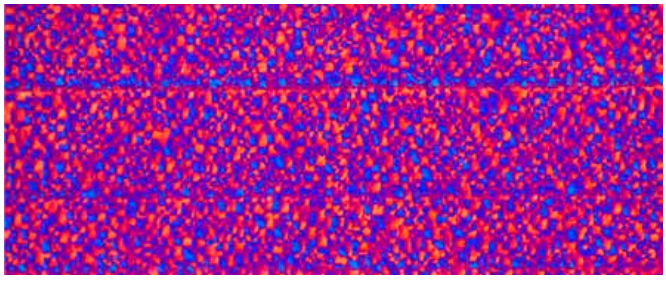


**Plastics and polymers**

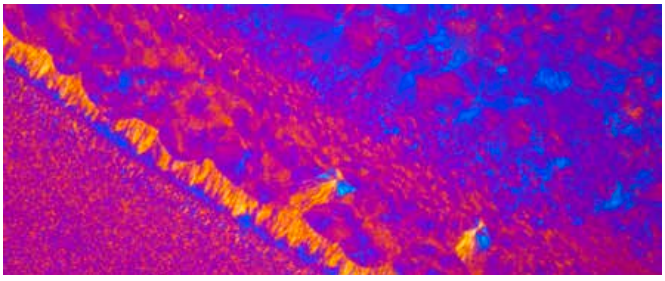
Polarization microscopy is advantageous for investigating plastics and polymers, because it enhances image contrast that allows certain sample structures and details to be distinguished.

The observation of birefringence helps to reveal internal crystalline structures, different phases,  and stress patterns within polymers. This ability can be crucial for understanding their properties and performance.

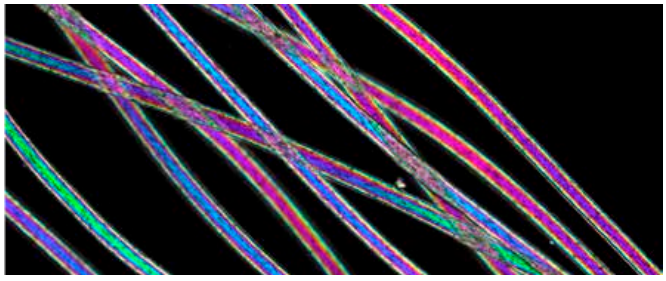
Stitched macro structure in polyethylene, crossed polarizers



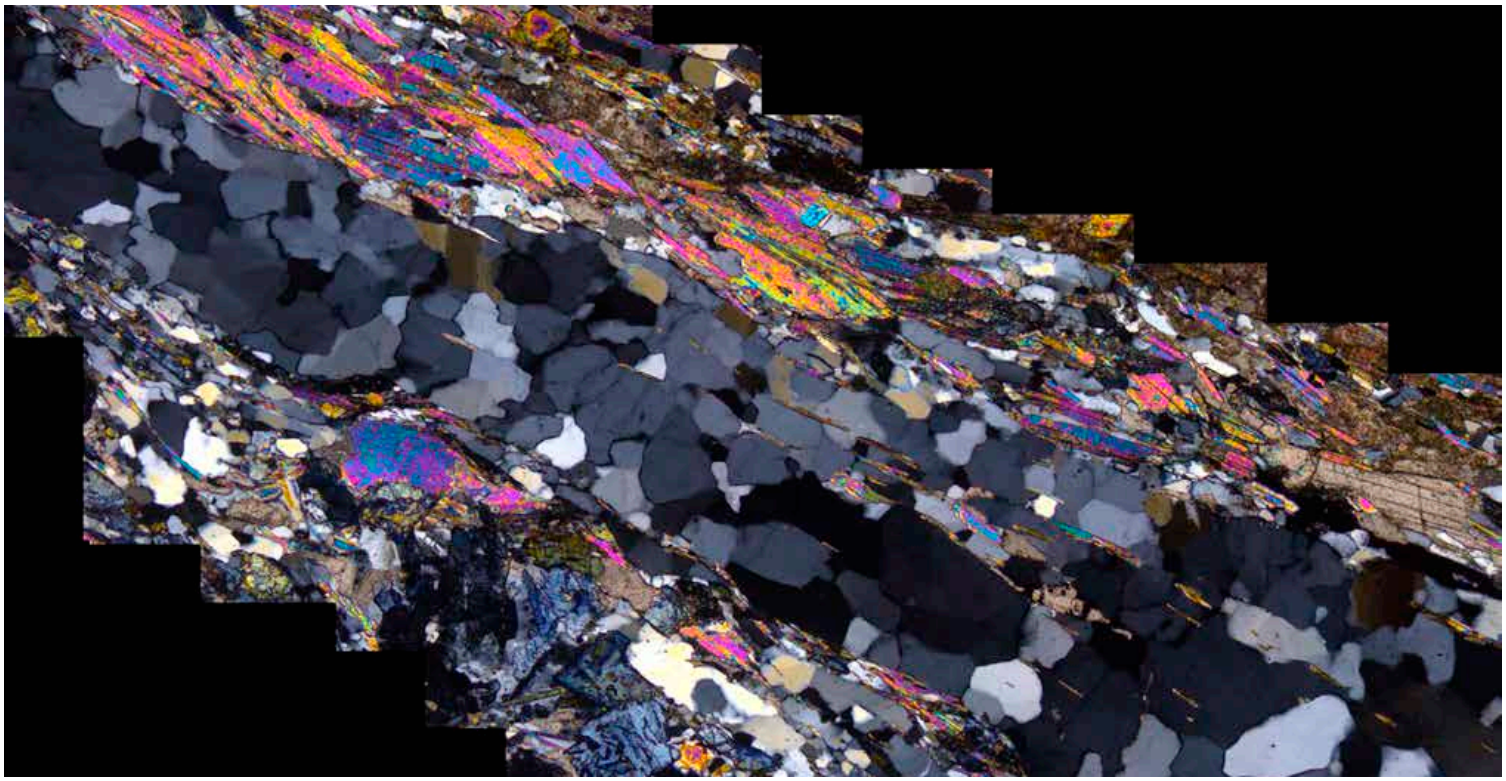
Polyethylene, 10x, crossed polarizers with full wave plate



Seam in a polymer, 10x, crossed polarizers with full wave plate



Nylon fibers, 20x, crossed polarizers

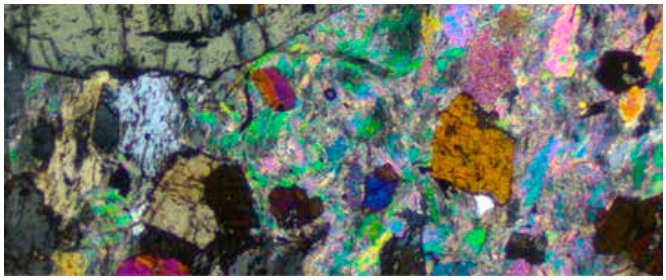


## Geoscience and exploration

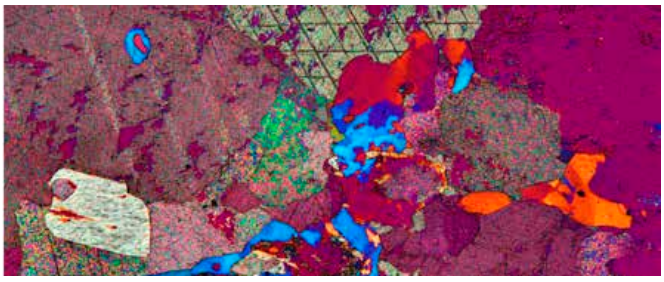
Visoria P is advantageous for investigating geological samples. With linear and crossed polarized light, you can identify and differentiate between various minerals based on their optical properties.

Polarization microscopy allows geologists to detect and analyze birefringence and microstructures, such as grain boundaries and inclusions, which are crucial for understanding rock formation.

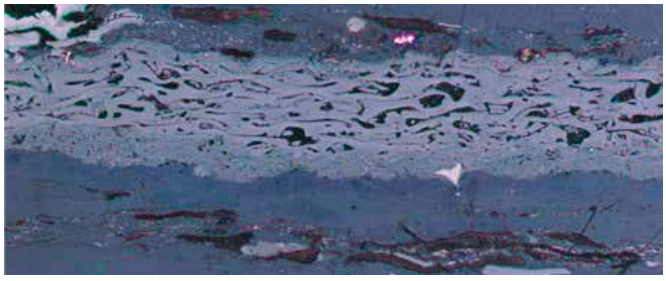
In geoscience exploration, polarization microscopy can help assess the quality of geological formations. For example, valuable mineral deposits and macerals in coal can be identified.



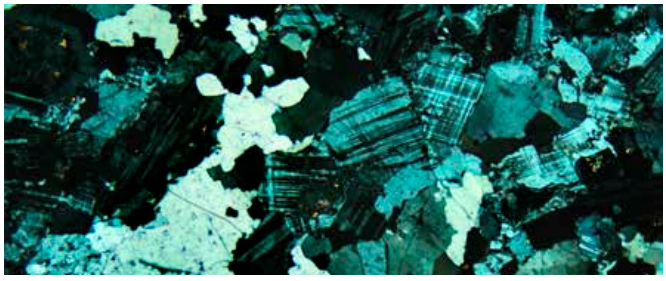
Microstructures in metamorphic rock, 2.5x, crossed polarizers



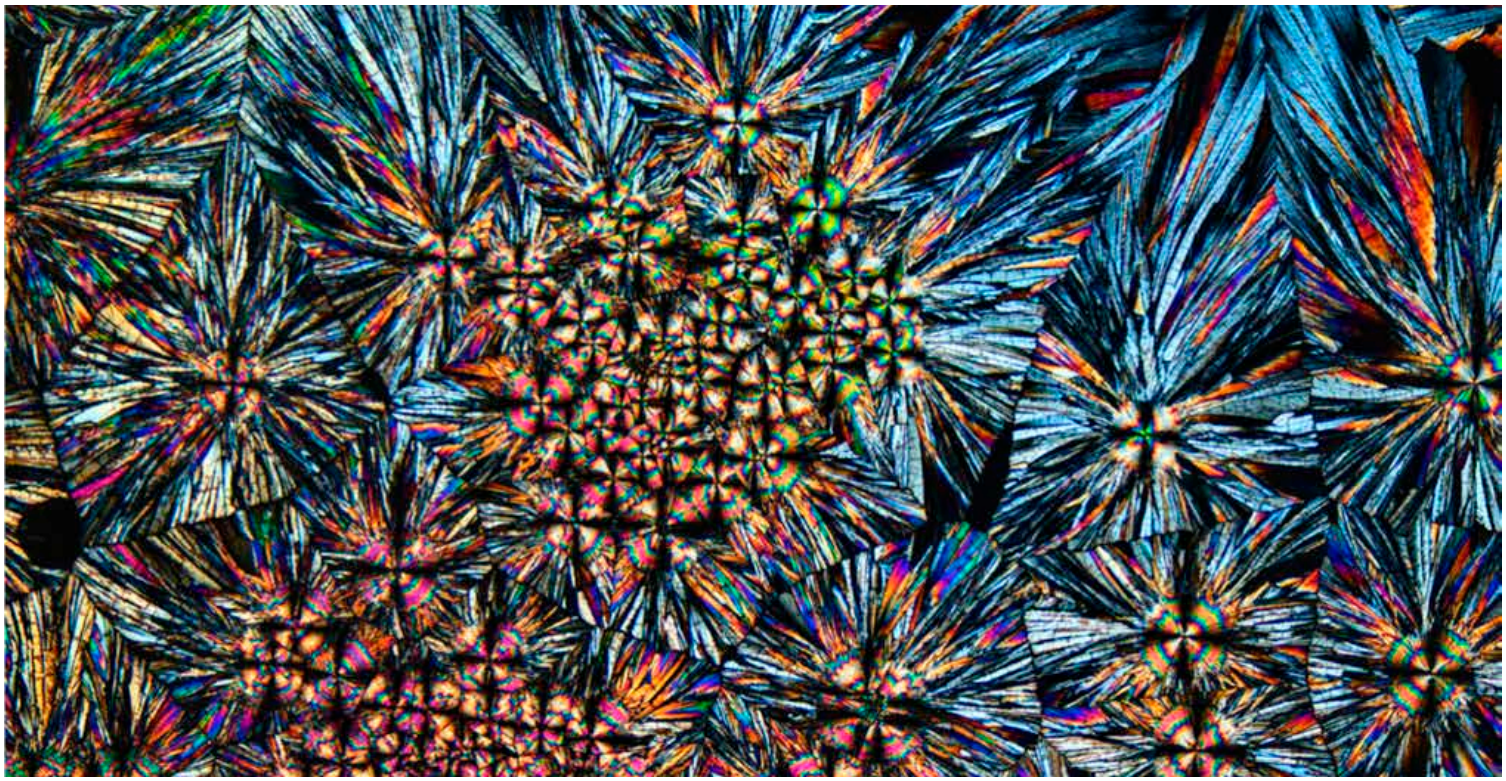
Carbonatite, 5x, crossed polarizers with full wave plate



Coal with different macerals, 20x, oil immersion, crossed polarizers

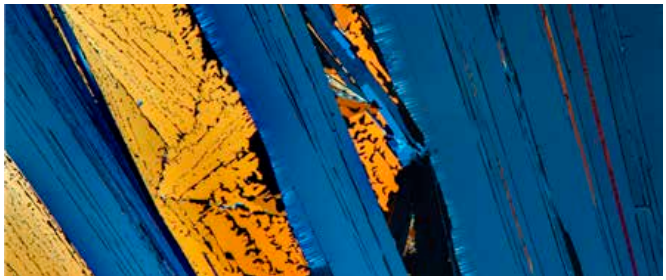


Granite, 2.5x, crossed polarizers

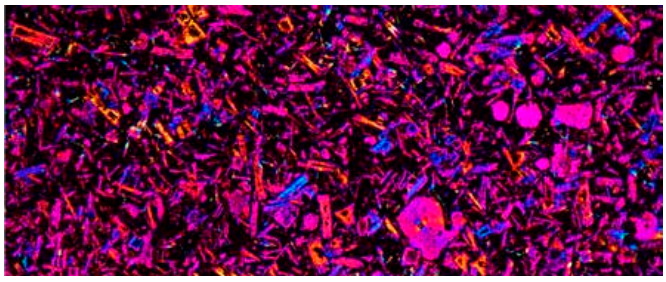


## Materials

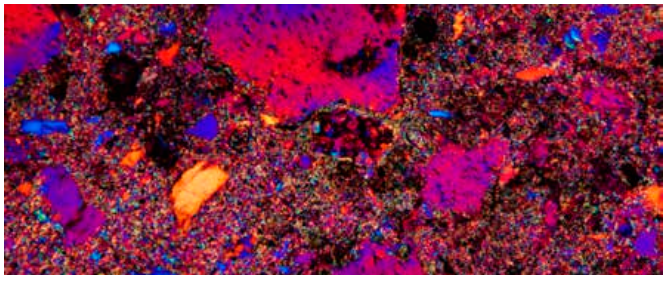
The Visoria P polarization microscope is useful for investigating birefringent materials. Crossed polarized light can enhance the contrast and visibility of internal material structures and provide valuable insights into properties like crystallinity and phase transitions. It also helps with the identification and analysis of material composition and defects, which is crucial for industrial quality control and R&D.



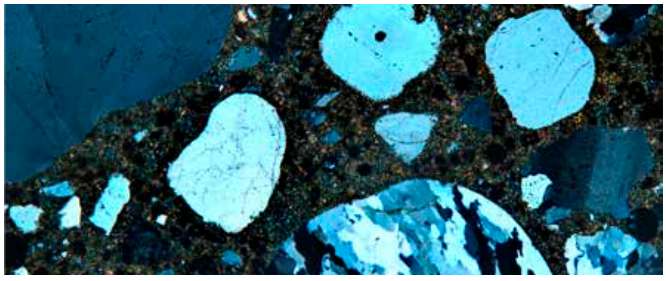
Dimethyltryptamine (DMT), 5x, crossed polarizers



Blast-furnace slag, 5x, crossed polarizers with full wave plate



Porous concrete, 10x, crossed polarizers with full wave plate



Concrete, 5x, crossed polarizers

## Specifications Visoria P

| | |
|---|---|
| **Microscope** | |
| Size and weight | Length: 410 mm, width: 331 mm, height: 505 mm, approx. 18 kg (depending on configuration) |
| Stand | Illumination toggle buttons with status indicator, image capture button, antimicrobial surface with AgTreat (ISO 22196) |
| **Optics** | |
| Nosepiece | Encoded 5x (M25), centerable |
| Eyepieces (FOV) | 20 / 22 / 25 mm |
| Tubes | Phototubes 50 / 50 with fixed port, 100 / 50 / 0 with fixed port, 100 / 50 / 0 with variable port |
| Digital version | Digital version with 10" screen / tablet |
| Ergonomic accessories | Wide range of ergonomic accessories available (ErgoTubes, ErgoLift, ErgoModules) |
| Encoded illumination management | IL and TL: High-power white LED, encoded 4-color fluorescence illumination, further external light sources on request (non-encoded) |
| Incident light axis | Manual encoded, 4-fold filter turret, color-coded diaphragm assistant; field and aperture diaphragm, slots for analyzer / polarizer, two filter positions |
| Fluorescence light axis | Optional |
| Incident light (IL) | Methods: Brightfield (with BF cube or Smith reflector), DIC, fluorescence, oblique illumination, qualitative and quantitative polarization |
| Transmitted light axis | Manual, fixed and flip-top condenser operation with color-coded diaphragm assistant |
| Transmitted light (TL) | Methods: Brightfield, darkfield, phase contrast, DIC, qualitative and quantitative polarization |
| **Operation** | 360° rotatable polarization stage with verniers and brake, 360° rotatable polarization stage with verniers, 45° clickstop position and brake. Stages are exchangeable and height adjustable. Further stages on request. |
| Stage | Scanning stage 75 x 50 mm, additional manual xy stages available, stage bracket for adaptation of 3rd party stages, bject clamps, sample holder without point counting, sample holder with point counting |
| Focus drive | Height-adjustable focus knobs, 19 mm travel range, maximum 28 mm total stage stroke depending on stage and condenser type, 2-gear focus drive (coarse / fine) with 1 mm scale, 3-gear focus drive (coarse / medium / fine) with 140, 4 and 1 µm scale, torque adjustment, and adjustable upper focus stop |
| **Accessories** | |
| Conoscopy | Bertrand lens cube, Bertrand lens module (A/B module), advanced conoscopy module (focusable) |
| Analyzer | Fixed, 180°, 360° |
| Polarizer | Fixed, 0 / 45 / 90°, 90° with rotatable lambda plate, 360°, fixed with lambda plate |
| Compensators | Tilting compensators up to 5 or 30 orders, quartz wedge, lambda and 1/4 lambda plate |
| **General specifications** | |
| Supply voltage | 100–240 V AC, 50 / 60 Hz, power consumption max. 15 W |
| Ambient conditions | 15–35°C, relative humidity max. 80% up to 30°C (non-condensing) |

CONNECT
WITH US!

Leica Microsystems GmbH | Ernst-Leitz-Strasse 17–37 | D-35578 Wetzlar (Germany)
Tel. +49 (0) 6441 29-0 | F +49 (0) 6441 29-2599

www.leica-microsystems.com