

Sean Stephenson

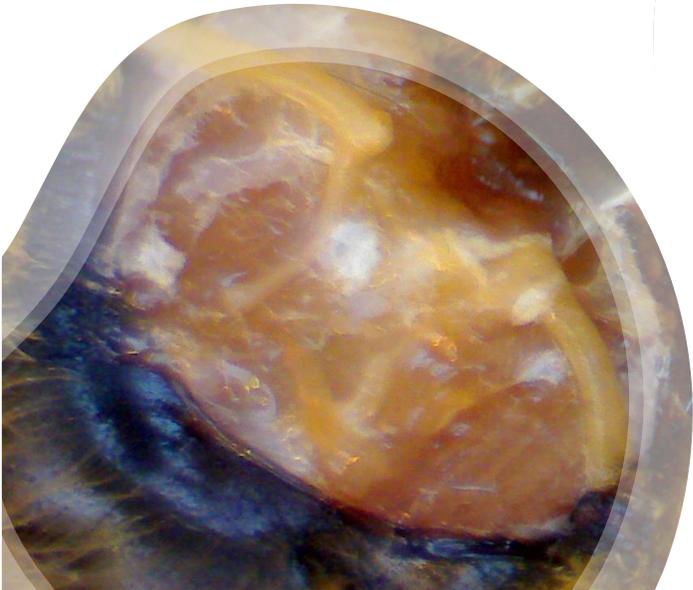
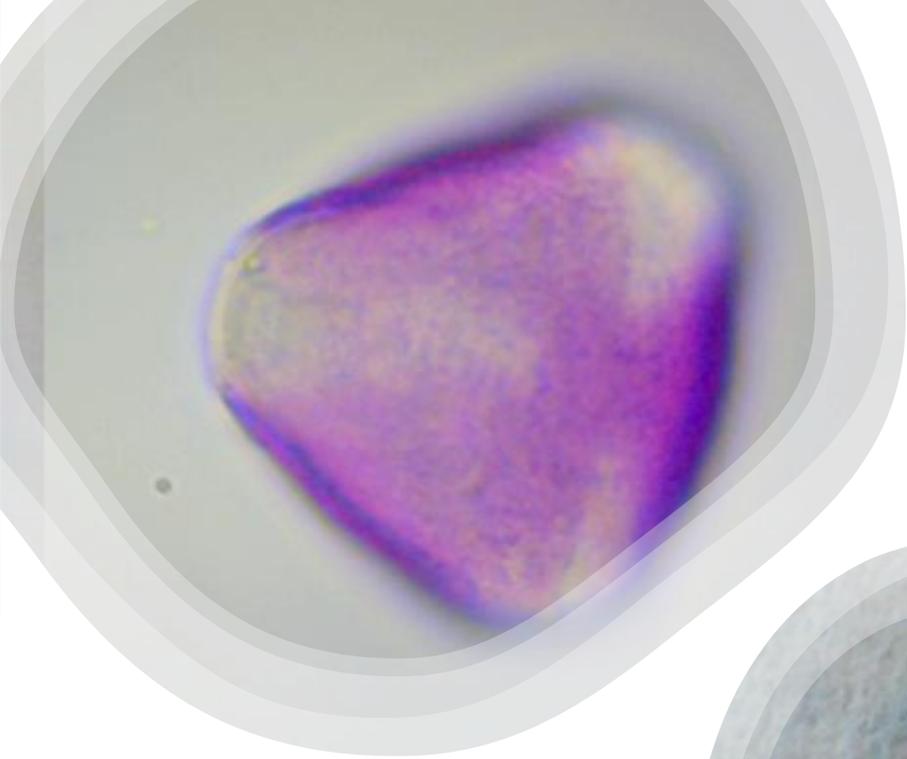
Introduction to Microscopes



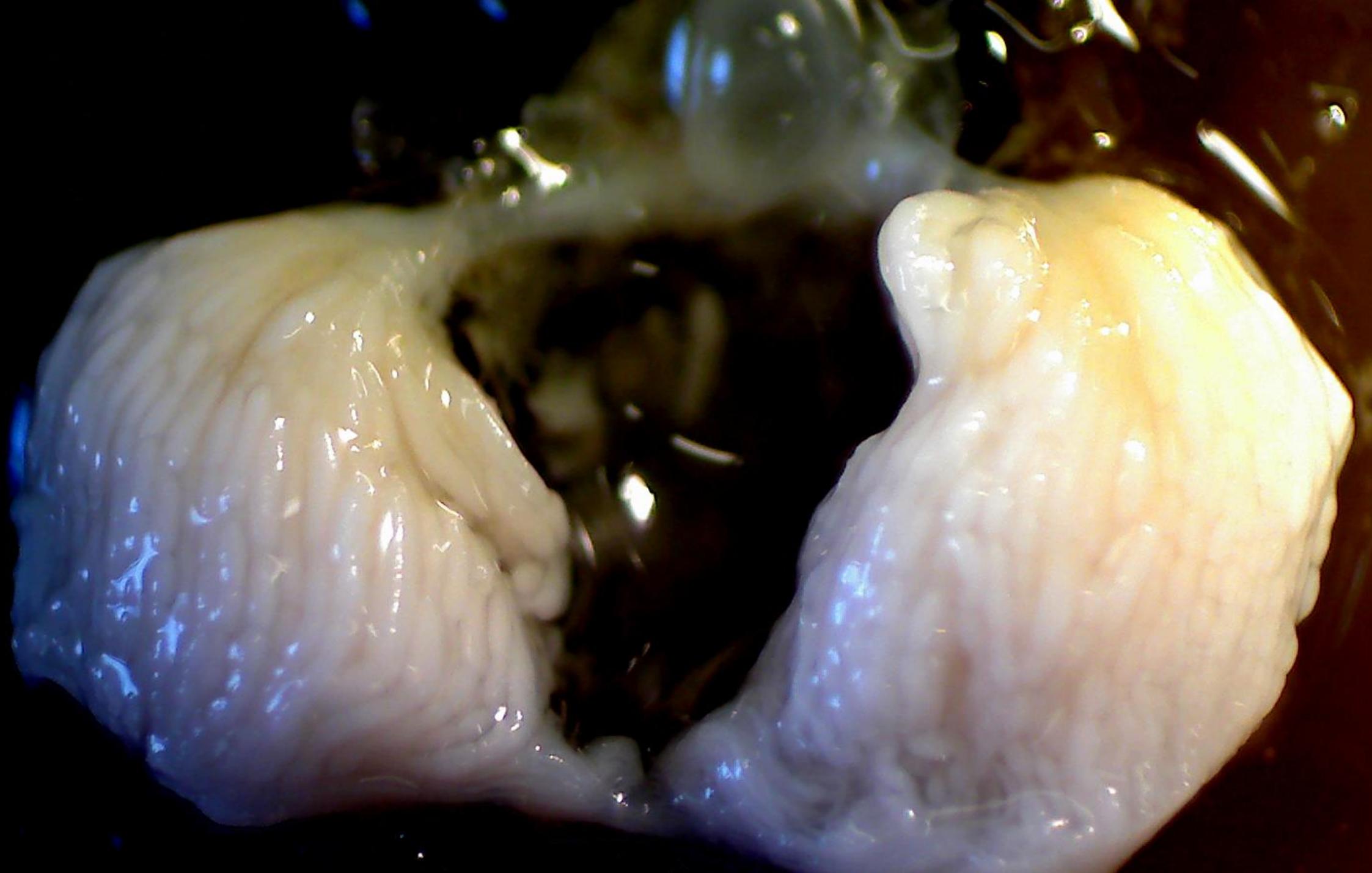
Topics

- Use of microscopes in Beekeeping
- Stereomicroscope
 - Features
 - Options
 - Setting up
- High powered microscope
 - Features
 - Options
 - Setting up
- Tools and extras
- Shopping list and where to buy

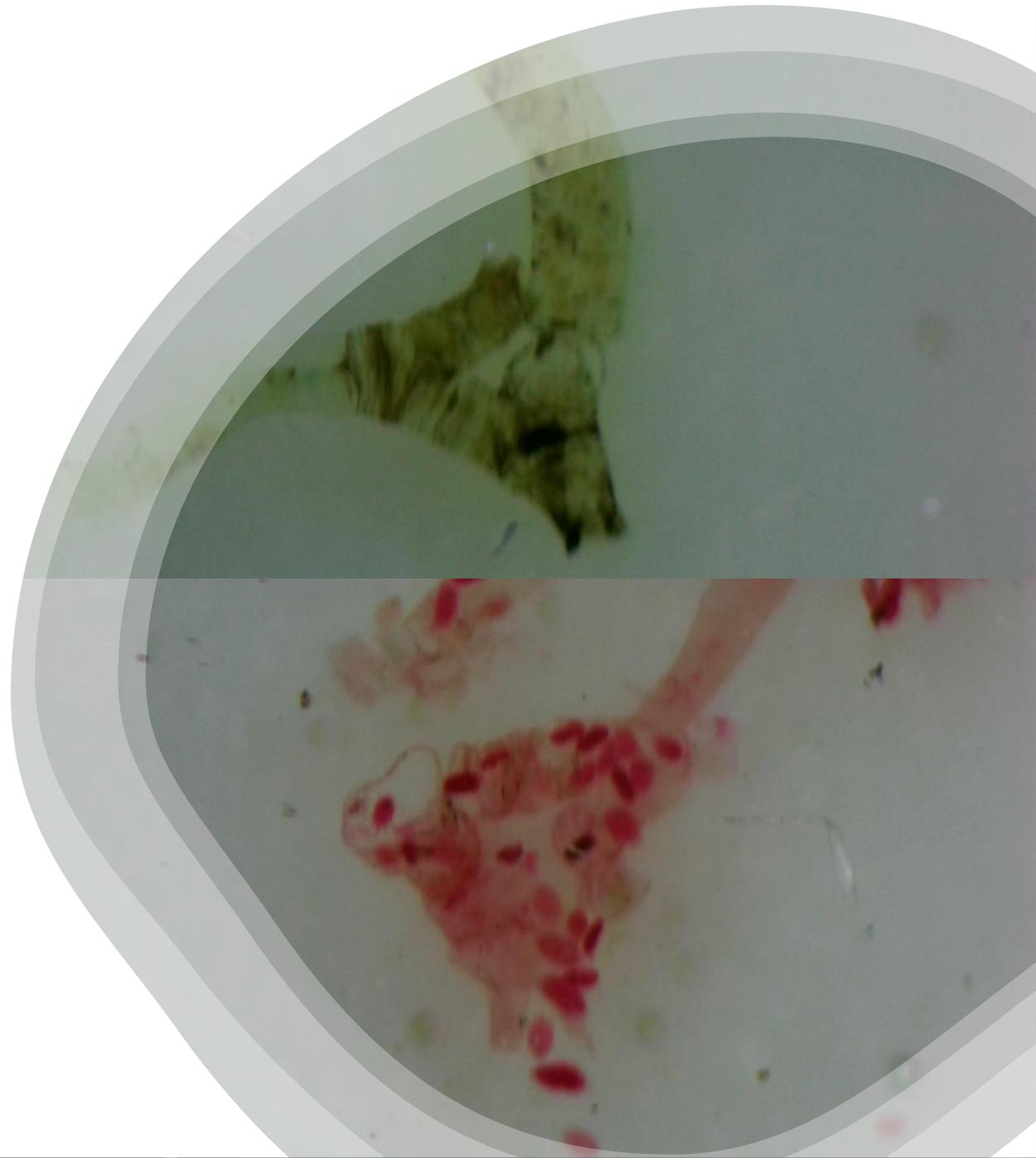
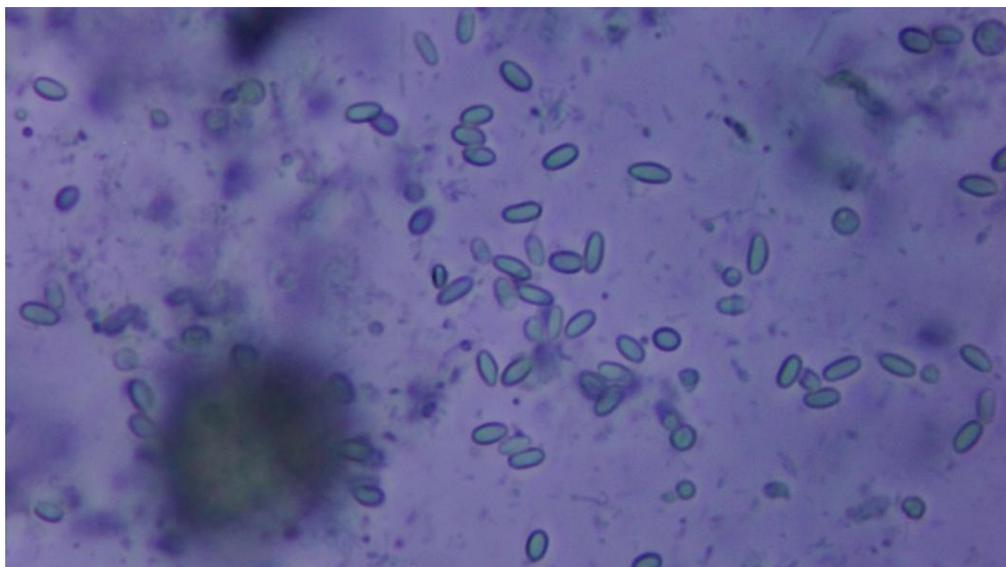
Microscopy and Beekeeping

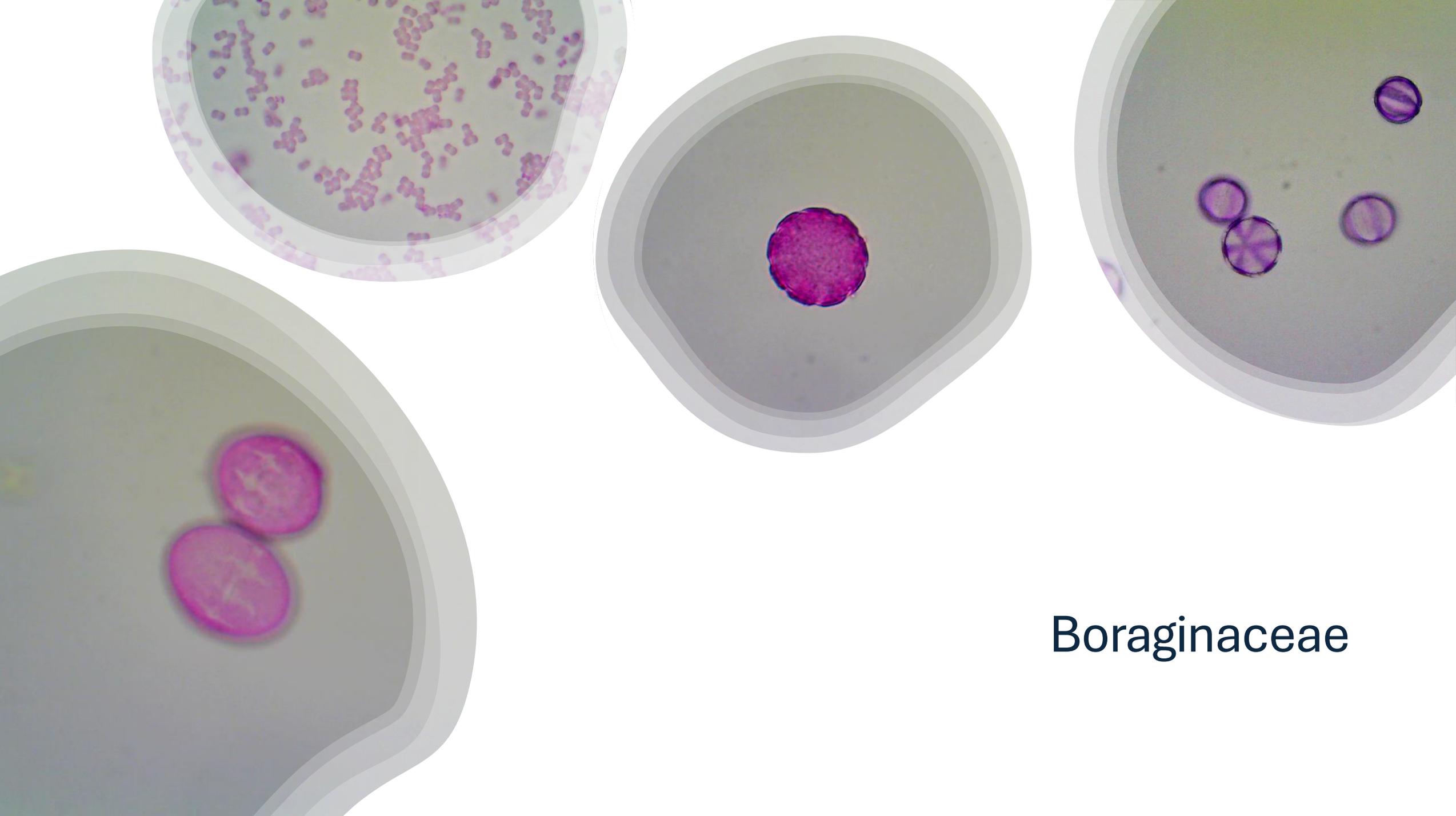


- Fascination of understanding what makes a honey bee
- Verifying disease
- Learning about our honey



Disease diagnosis

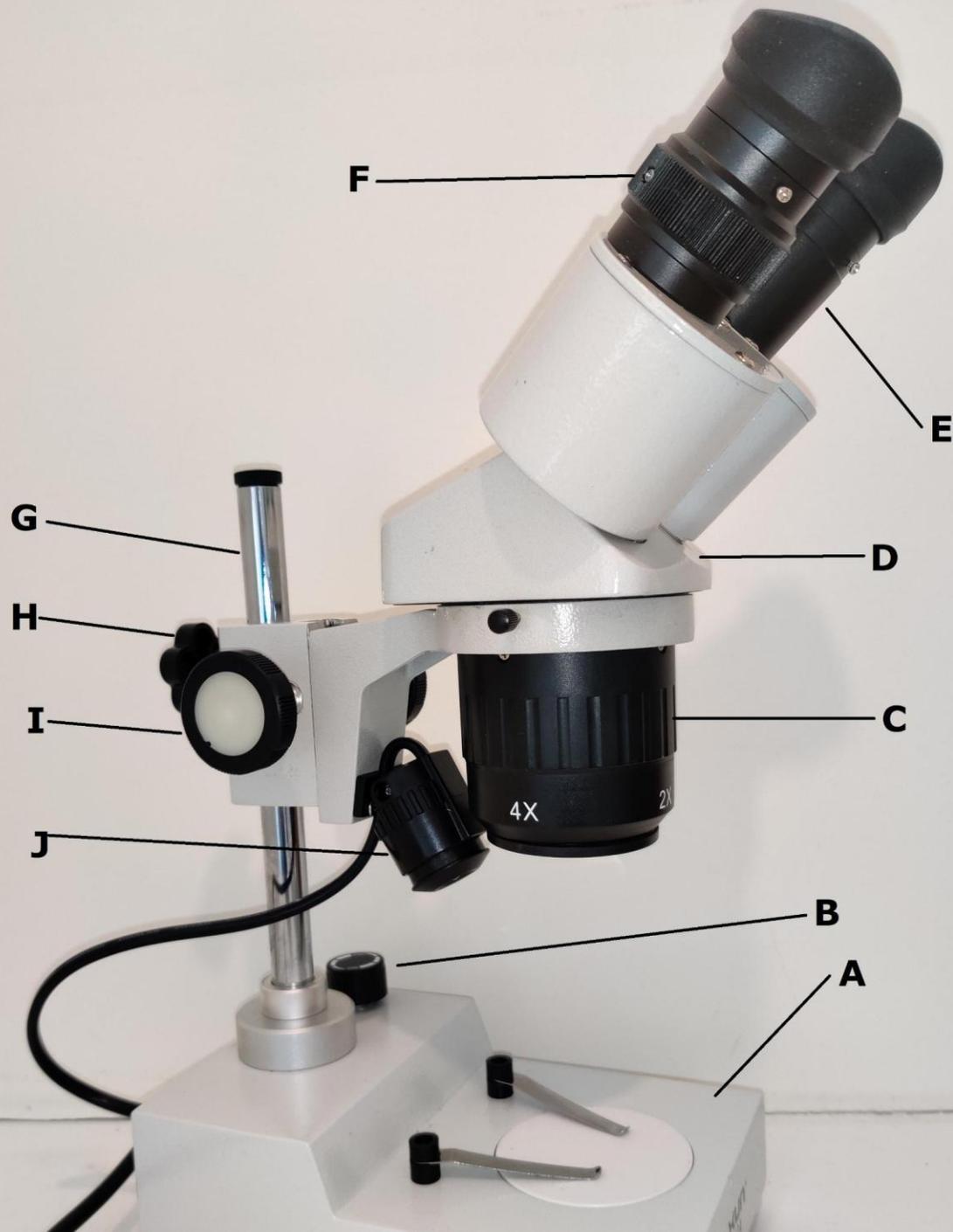




Boraginaceae

Steromicroscope

- A. Stage
- B. Power/light intensity
- C. Objective lens x2 and x4
- D. Prism
- E. Eyepiece, lens x10
- F. Dioptic control
- G. Mast/pillar
- H. Course focus
- I. Fine focus
- J. Light source (LED)



Setting up a Stereomicroscope

- Ensure the fine focus is set to the mid point
- Place an object on the stage and course focus on to the surface, lock off clamp on the mast
- With one eye fine focus the “fixed” eyepiece on the surface of the object
- With the other eye fine focus using the dioptic control
- Look through both eyepieces and adjust the field of view to a single circle
- Ensure sufficient reflective light on subject, use additional lights if necessary



Field microscopes & hand lenses



Low power monocular
and Stereomicroscopes



Non Zoom Stereomicroscopes



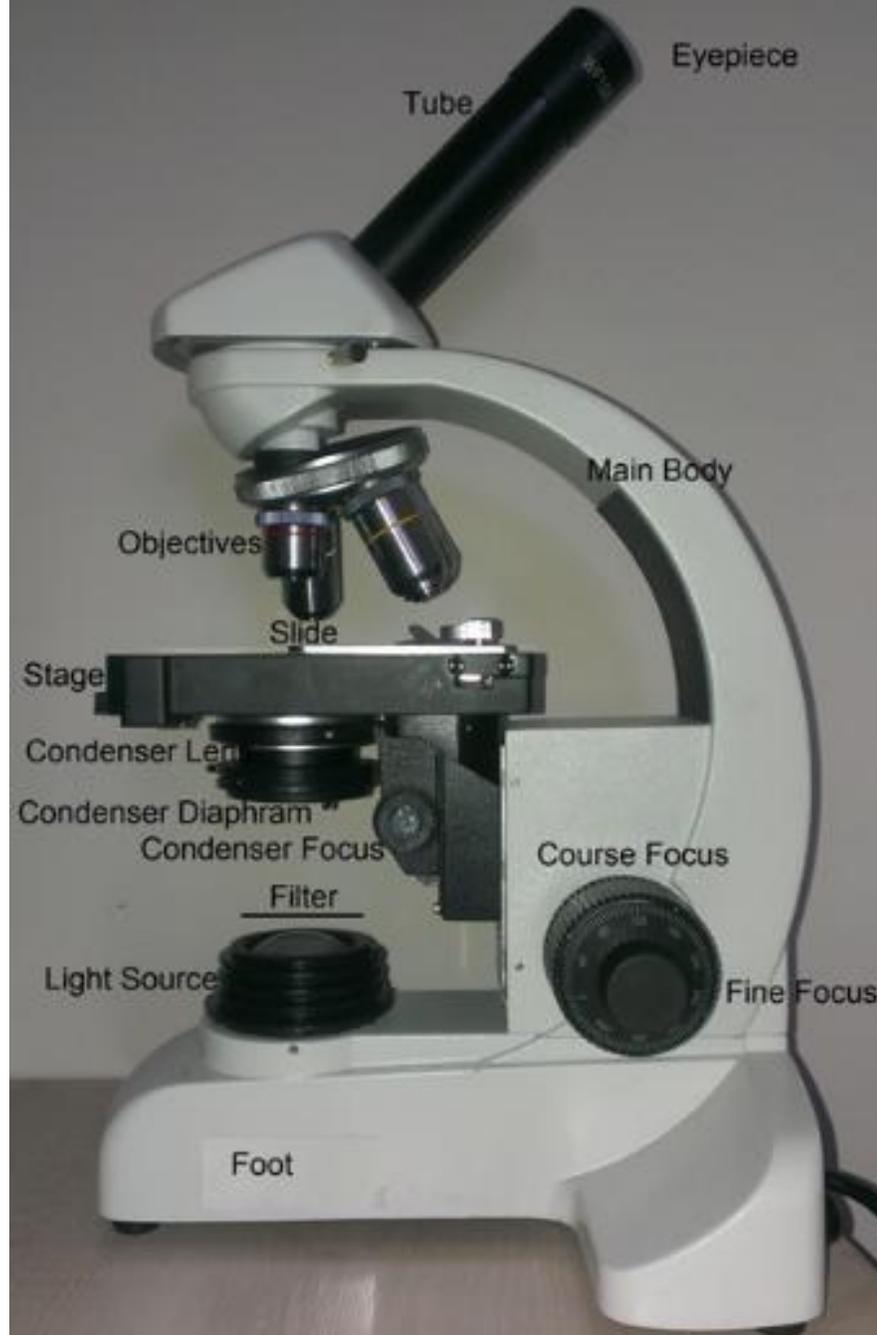
Zoom Stereomicroscopes

Microscope range

Considerations:

- Working distance, suitable distance between objective lens and stage
- Cost
- Use
- Portability

Compound Microscope



- **Stage**
 - Hold the object to be examined and to move the object under the lens. Usually called a mechanical stage.
- **Condenser**
 - Illumination of object, produce a cone of light (focused on the top of the slide) to exploit the objective
- **Diaphragm**
 - Controls the amount of light passing through to the object, reduced light improves the contrast
- **Eyepiece**
 - Balance of the magnification e.g. $x10$ in eyepiece $\times x10$ in objective = $x100$ magnification
- **Objective**
 - Lens with a short focal length, large aperture, produces the real image
- **Course and Fine Focus**
 - Course focus controls large approximate movement of objective
 - Fine focus, focuses in on the object
 - Focus stop prevents the objective touching the slide

Setting up the compound microscope

- **Set Focus Stop**

Place a slide with cover slip on the stage
Select the highest magnification objective
Move the course until the objective nearly touching the coverslip, view from the side of microscope
Set the Focus Stop

- **Focus on slide**

Start with lowest power objective
With brightness about 80%, condenser in uppermost position and diaphragm fully open
Place a slide with an ink mark on the top surface of the slide on the stage (no coverslip)
Focus on the edge of the image

- **Focus the condenser**

Open filter, below the condenser
Place needle or fine object on the light source
Adjust the focus of the condenser until the outline image of the needle comes into focus
Do not touch the focus of the objective
Repeat with each objective up to the magnification you intend to use
Close filter

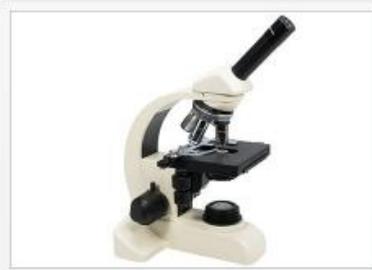
- **Set up the diaphragm**

Remove the slide from the stage
Remove the eyepiece
Open the condenser diaphragm
From a distance look down the eye tube
Close the diaphragm slowly until the edges of the diaphragm can be seen, blocking out about 10% of the light

Microscope range

Considerations:

- Cost
- Portability
- Camera
- Lens quality, infinity planachromatic
- Light source, Kohler illumination
- Parfocal



Brunel SP30

This microscope is a high quality, high performance instrument ideal for those who want extra from a monocular microscope.
[Price £222](#)

[Product Information](#)



Brunel SP28 LED

The SP28 is a new addition, allowing both the examination of slides and whole objects at low power. Exclusive to Brunel.
[Prices from £279](#)

[Product Information](#)



Brunel SP35

A binocular microscope at a really affordable price with DIN standard objectives.
[Price from £245](#)

[Product Information](#)



Brunel SP52

This bridges the gap between amateur and professional microscopes.
[Price from £398](#)

[Product Information](#)



Brunel SP60

The SP60 is part of our high spec range that is offered at a very reasonable price.
[Price £533](#)

[Product Information](#)



Brunel SP100

The SP100 is an advanced specification microscope and is recommended for its optical performance.
[Price £665](#)

[Product Information](#)



Brunel SP150

The SP150 trinocular represents the best value for money available for a plan infinity microscope.
[Price from £797](#)

[Product Information](#)



Brunel SP300

The SP300 is a laboratory specification microscope. Recommended for phase contrast.
[Price from £1329](#)

[Product Information](#)

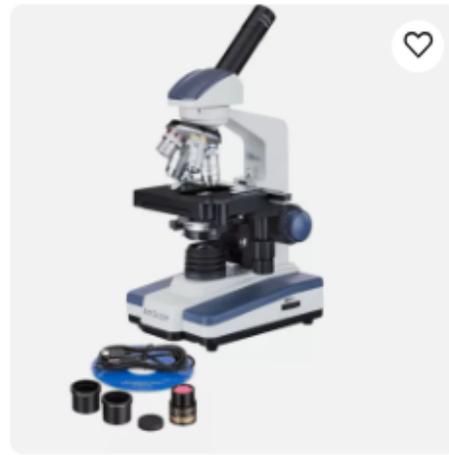


Brunel SP29 Handheld

The SP29 is a handheld microscope with a magnification range of up to x800. Ideal for field work.
[Price £329](#)

[Product Information](#)

eBay



AmScope 40-2500X LED Digital Monocular Compound Microscope 3D Stage 5MP Camera

Brand new

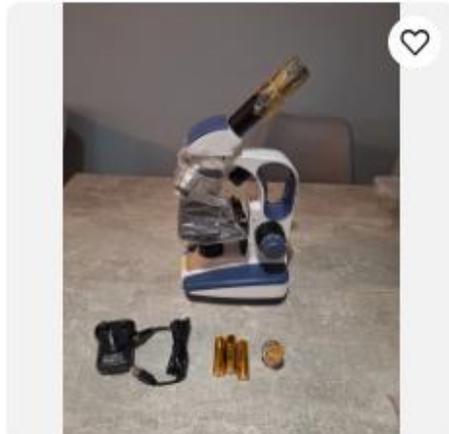
£280.99

Buy it now

Free delivery
from Netherlands

amscope (82,444) 98.9%

Sponsored



Swift Compound Monocular Microscope SW200DL with 40X-1000X Magnification (1761)

New (other)

£89.99

Buy it now

+£3.99 delivery
Click & Collect

simplebuddy28 (594) 100%



20X 40X Industrial Microscope Binocular Stereo Microscope for Clock Repairing

Brand new

£105.48

Buy it now

Free delivery
from China
28 watchers

opticsworld2016 (4,367) 99.5%

Tools and Extras

- Scalpel, No. 3 handle with No. 11 blade (Amazon)
- Fine and course scissors (Amazon)
- Fine Tweezers (Amazon)
- Pipette (eBay)
- Glass rod (eBay)
- Seekers (homemade)
- Acarine pins (homemade)
- Sewing pins
- Watch glasses (eBay)
- Petri dish (eBay)
- Fuchsin stain (Brunel)
- IPA (Amazon)
- Work mat (Lakeland plastic)
- USB coffee warmer (Amazon)
- Slides and cover slips (eBay)
- Tool bag (Brunel)
- Wax tray (home made)
- Soldering iron (Amazon)
- Vials (eBay)
- Liquid bottles (eBay)



Questions?