

Umeå University: *The 6th Annual Workshop
in Photomicrography & Digital Image Processing for Science*

Day one: Tuesday 13. January

8:30 Faculty & Participant Introduction

9:30 Overview: Imaging and Microscopy

The Light Microscope & its Parts

- Evaluating each component part & its operation
 - objectives
 - frame/chassis
 - light source
 - optics
 - stage and mechanics

Forming optical images with a microscope

11:15 Brightfield Illumination and Aperture Diaphragm

- Kohler technique
- Resolution & contrast

12:30 Lunch

13.30 Digital Camera Fundamentals

- Pixels and recording light
- Sensors: linear and area array
- Digital resolution
- Dynamic range
- Bit Depth

Camera Operation

- Camera and viewing magnification differences
- Light Measurement and exposure
- Photo/Imaging Pathways
- Compensating for automatic exposure
- Gain
- Binning
- Contrast
- File Types

Fundamentals & the language of Imaging

- Exposure
- Concepts of color and white/black point setting
- Light Sources & color reproduction
- Color accuracy and filters
- Light measurement
- Image Characteristics

Digital Work Flow

- Capture, archiving, renaming, transfer, ...
- Input to output

14:30 – 15:30

Fundamentals of Image Processing

- Environment and Image Viewing
- Color Space and mode
- More on file types
- Image resolution, interpolation, re-size
- Basic Image processing
- Histograms & Color
- Layers and Adjustment layers
- Curves & levels
- Pixel changes and science

Day two Wednesday 14.January

8:30

Other microscopical techniques

- Phase contrast
- Darkfield

10:00

Hands-On open lab

12:00

Lunch

13.00

Other microscopical techniques

- Fluorescence

14.00

Using Adobe PhotoShop and more

16:30

Hands-On open lab

17:30

Course Dinner

18:30 – 19:15

Other microscopical techniques - DIC

19:15 - 20:15

Questions and Open Lab

Day *three* Thursday 15.January

8.30 Helicon Focus, Zyrene Stacker, Adobe Photoshop and Nikon Elements increased focus

9:30 Hands-On & Open Imaging lab

10:30 Confocal lecture and Super resolution imaging

11:30 Open Lab

12:00 Lunch

13.00 Open Lab

14:00 – 15:30 – session 1

15:30 – 17:00 – session 2

**Confocal lecture demo group sessions
PhotoShop Groups
Hands – on Groups**

Day *four* Friday 16.January

8:00 – 9:30 - session 3

9:30 – 11:00 session 4

**Confocal lecture demo group sessions
PhotoShop Groups
Hands – on Groups**

11:00 Open Lab

12:00 Course Concludes