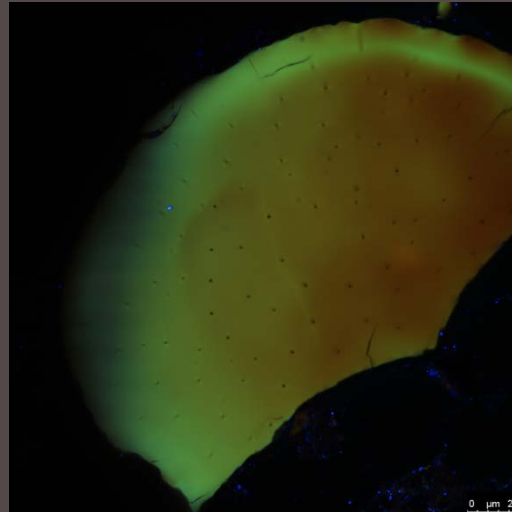
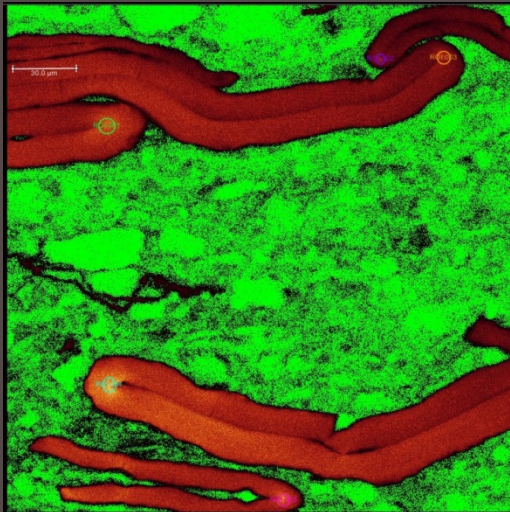


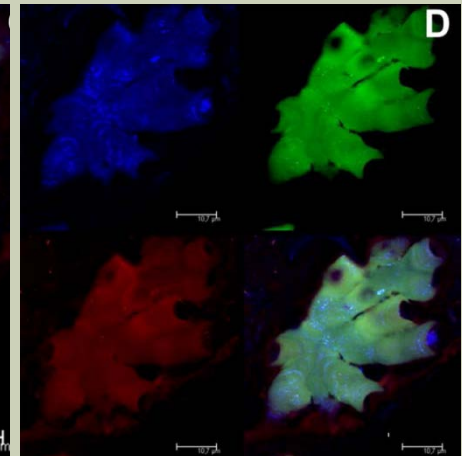
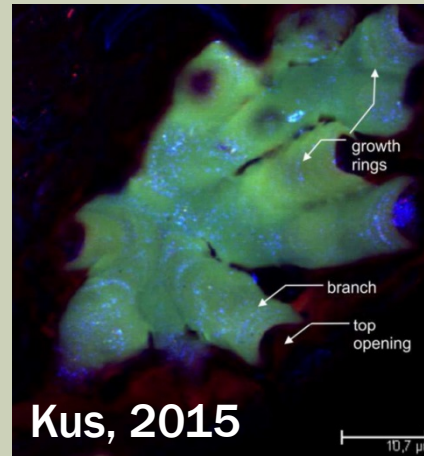
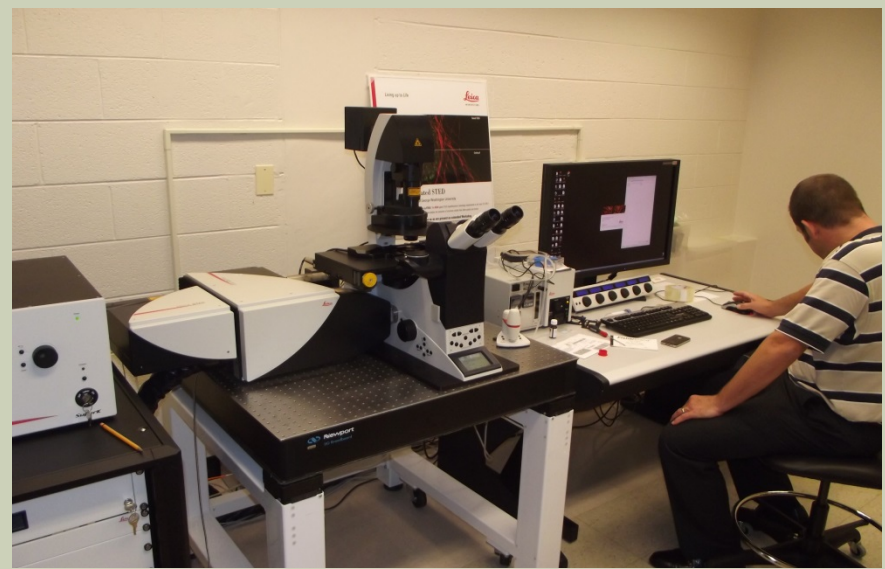
PROPOSAL FOR NEW ICCP WORKING GROUP IN COMMISSION II: APPLICATIONS OF CONFOCAL LASER SCANNING MICROSCOPY (CLSM) TO ORGANIC PETROLOGY



Paul Hackley
Jolanta Kus

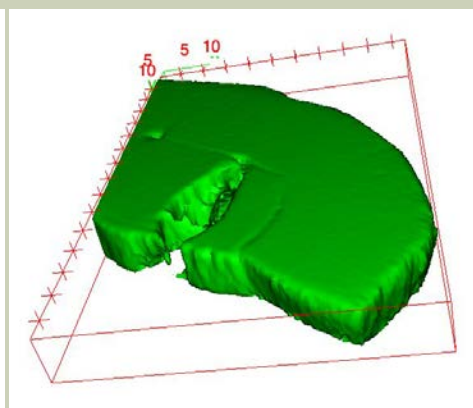
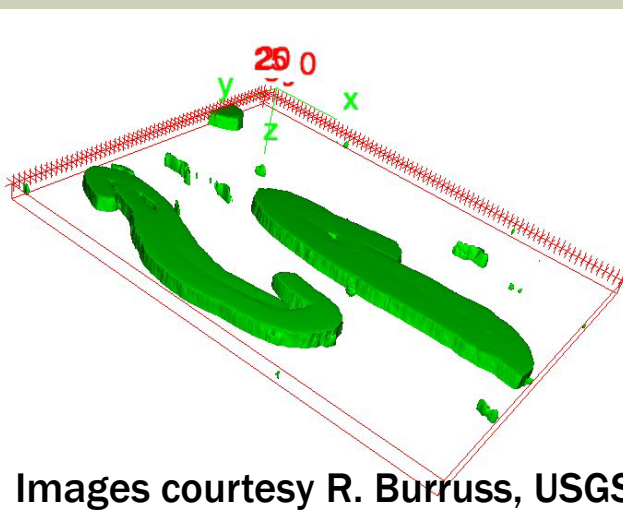
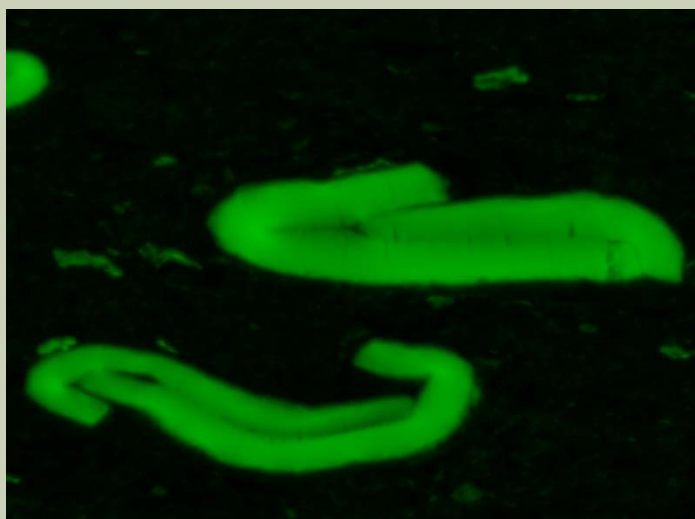
BASIS FOR PROPOSAL: WHY SHOULD ICCP DO THIS?

- ❑ Confocal laser scanning microscopy (CLSM) has been applied to the petrology of sedimentary organic matter since late 1990s
- ❑ Non-destructive 2-D and 3-D imaging at high resolution: images, videos, spectroscopy
- ❑ Used to determine thermal maturity (Hackley & Kus, 2015)
- ❑ Underutilized, not broadly applied
- ❑ Instrument access may be limitation



IMAGING

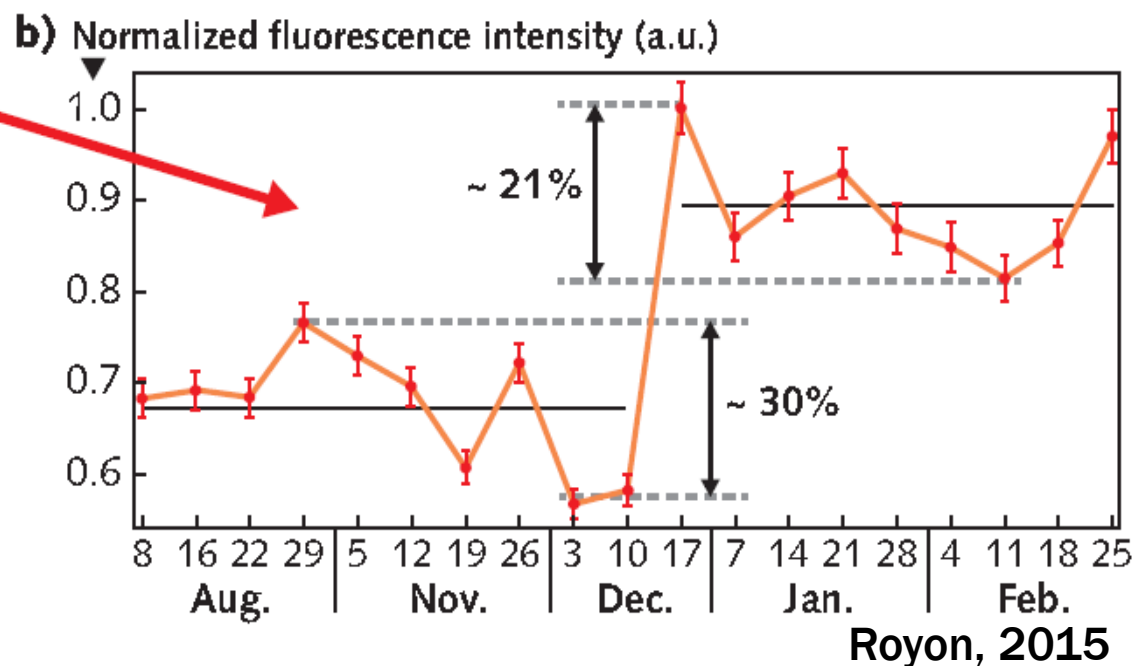
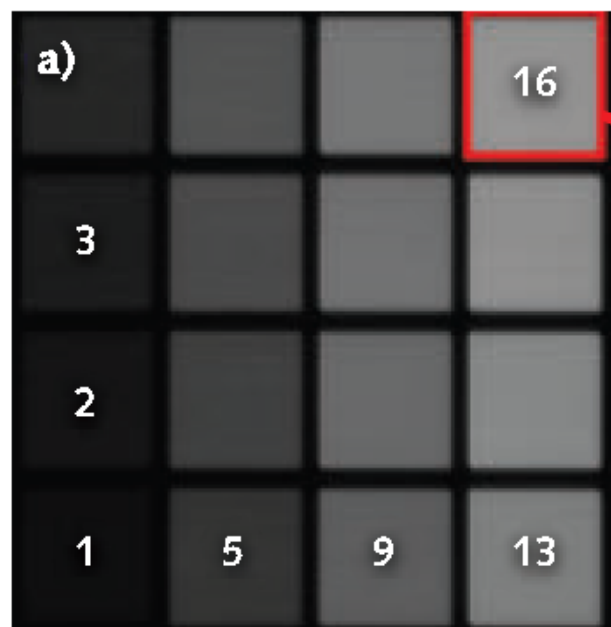
□ Imaging applications



Images courtesy R. Burruss, USGS

- Pseudo color CLSM fluorescence images of Tasmanites. Left, 2D maximum intensity projection of 26 0.5 micrometer z-sections, 388 micrometer wide FOV. Middle, 3D surface plot of image volume. Right, zoomed view of 3D volume outlined on 2D image.
- Microscope: Leica SP5, 458 nm excitation, 486 nm emission, HCX PLAPO CS 63.0x 1.20n.a. water immersion objective

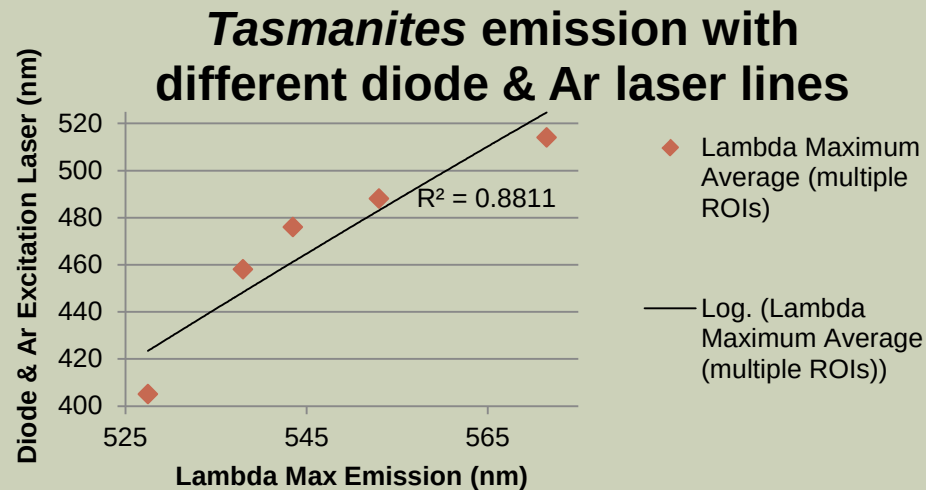
FLUORESCENCE INTENSITY



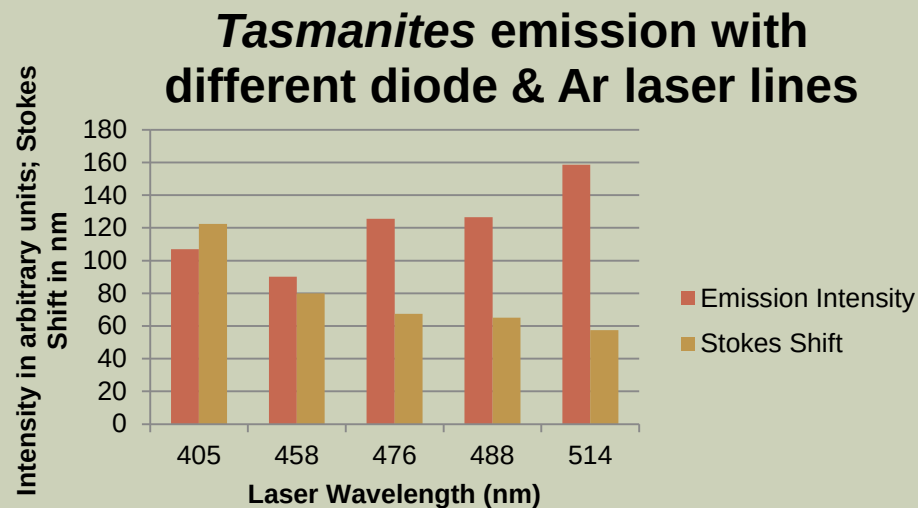
- What can we do to improve intra- and interlaboratory reproducibility in fluorescence intensity measurements?

SPECTROSCOPY

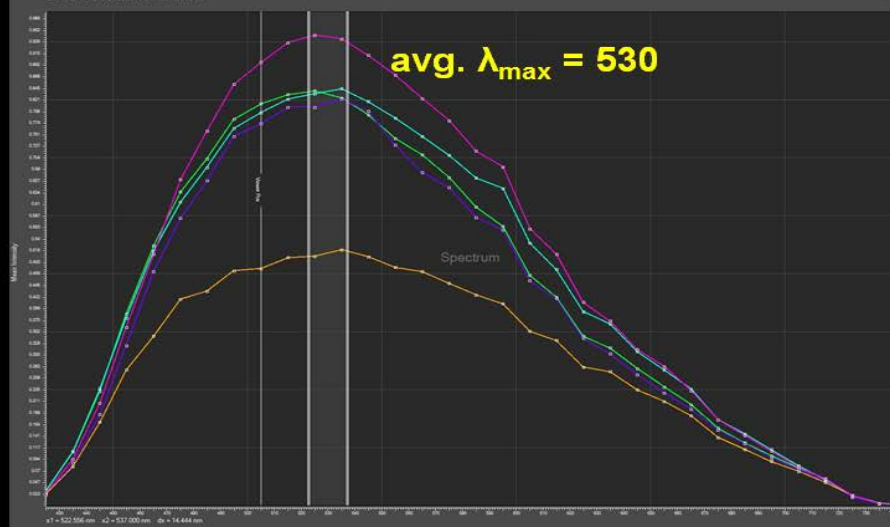
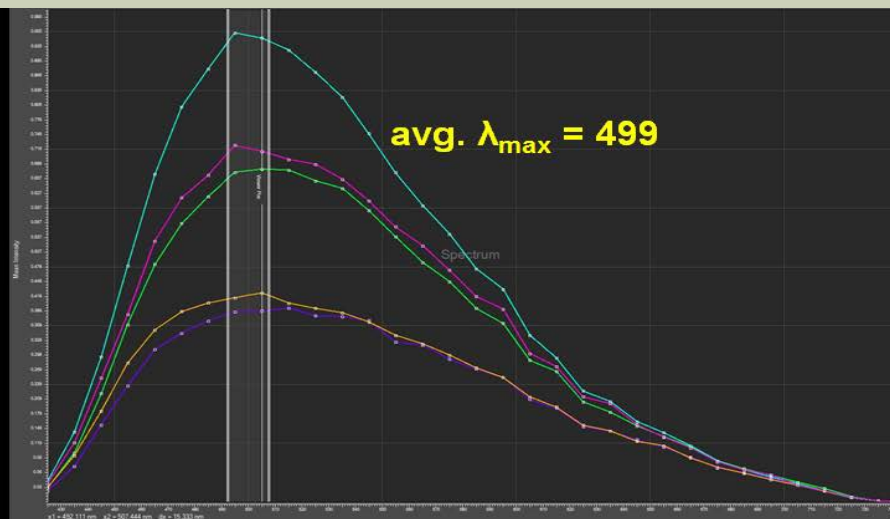
□ Relation between Tasmanites fluorescence emission (λ_{max}) and diode + Ar laser excitation wavelength of same field



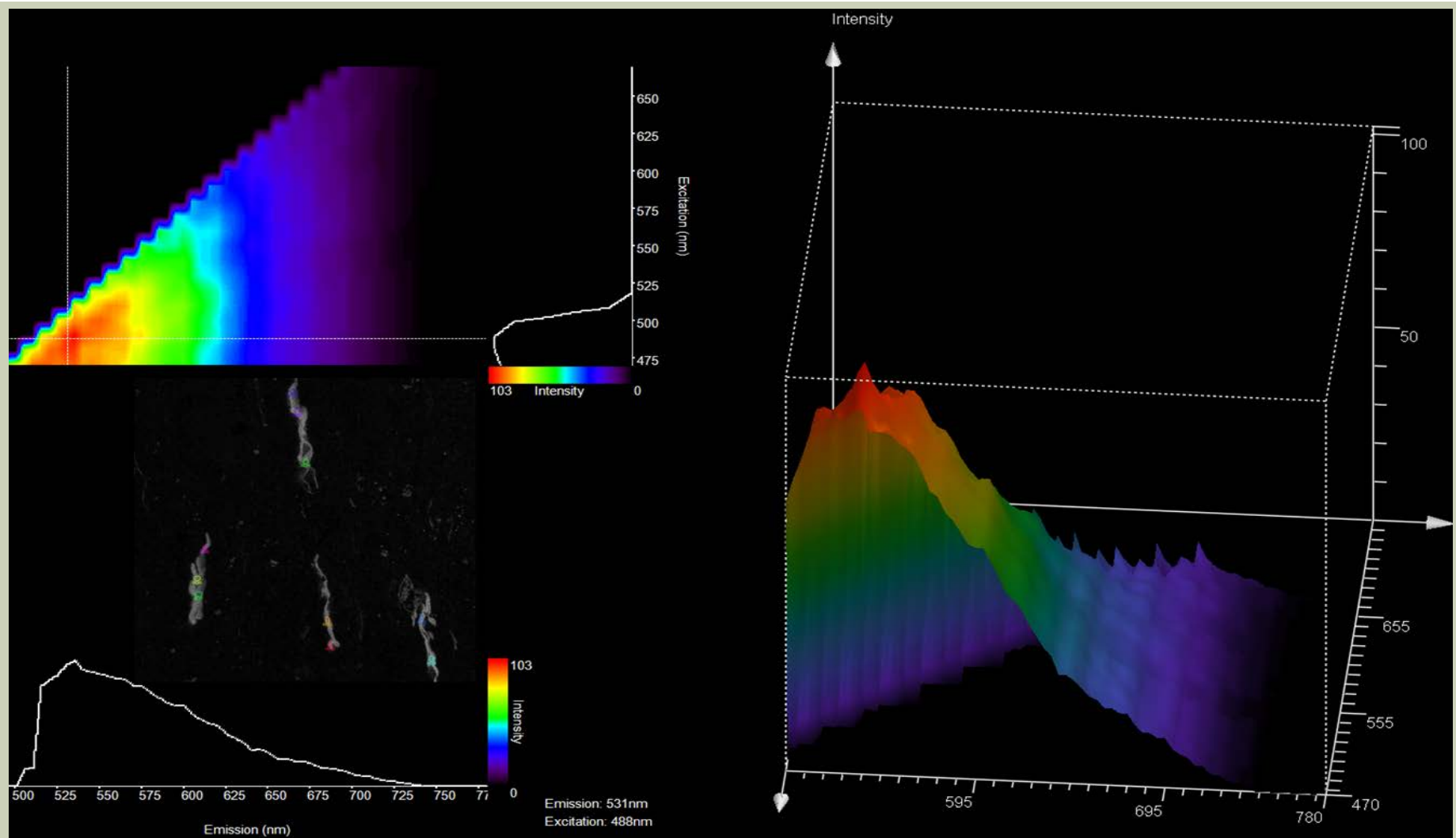
□ Variations in Tasmanites emission intensity and Stokes shift from same field acquired with different diode + Ar laser lines



SPECTROSCOPY: VARIATION

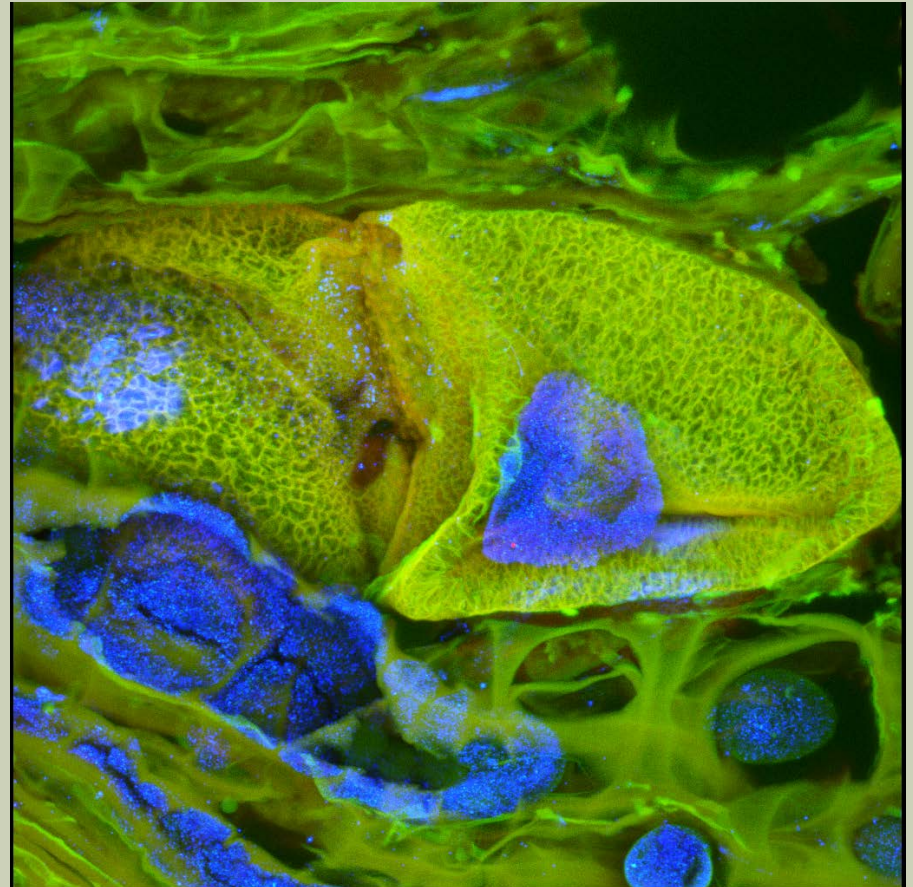


SPECTROSCOPY: WHITE LIGHT LASERS



PROPOSED WORK PLAN

- ❑ Year 1: **SURVEY**: Identify potential participants; identify instrument access; instrument types (lasers, detectors, lenses, etc); **DECIDE ON STUDY OBJECTIVES**.
- ❑ Years 2-3: Distribute samples; work will depend on participants, instruments and purpose; reports to ICCP General Assembly and in Newsletters.
- ❑ Year 4: Finalize results and prepare summary manuscript.





Thank You!