



*DEPARTMENT OF CHEMISTRY*

**DEPARTMENTAL SEMINAR**

**Professor Christa Brosseau**

*Saint Mary's University*

## **"SERS\* Enters the Art Scene: Nanoscience as a Tool for Art Conservation"**

### **\* Surface-Enhanced Raman Spectroscopy**

Surface-enhanced Raman spectroscopy (SERS) is a new analytical method for the detection of artist dyestuffs. Recently we have explored two ad-hoc SERS methodologies for the detection of artist colorants. The first method couples thin layer chromatography (TLC) and SERS to aid in the detection of samples which contain more than one colorant. In cases where the sample size is exceedingly small, we have explored in situ non-extractive direct SERS using concentrated silver colloids. This work has been used to identify colorants present in various artist media, including textile fibers, pastels and watercolors.

Christa received her BSc degree from Dalhousie U-ty and MSc degree from Acadia U-ty. In 2007 she completed a PhD program at the University of Guelph under the supervision of Prof. Jacek Lipkowski on a project that involved electrochemistry and IR spectroscopy. In 2007 she moved to Evanston, Illinois to take up an Andrew W. Mellon Foundation postdoctoral fellowship at Northwestern University. Since 2009 Christa is Assistant Professor at Saint Mary's.

**MACN-222**

**Friday, November 20<sup>th</sup>, 2009, at 10:45 am**

**Coffee and Timbits will be served at 10:30 am in MACN-222**

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# SERS enters the art scene: Nanoscience as a tool for art conservation

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Art conservation, restoration and authentication efforts rely on the accurate identification of artist's materials. The ability to elucidate dyestuffs which have a natural or early synthetic origin is important as these pigments are often photosensitive, and their colors can fade rapidly if the artwork is not displayed properly.

Current methods for pigment detection (i.e. HPLC) require large amounts of sample (~1mg). Given that most conservation samples come from rare and priceless works of art, such quantities are often not possible to obtain. Therefore, an optimal analytical technique for determining pigments in art specimens would be minimally invasive, sensitive and reproducible. Recently the Van Duyne group, in collaboration with the Art Institute of Chicago, has been exploring the use of Raman spectroscopy, specifically surface-enhanced Raman spectroscopy (SERS) as an analytical method for the detection of artist dyestuffs. SERS is ideally suited for this problem, as it enhances the Raman signal of the scatterer, and also quenches fluorescence, a common problem encountered with the normal Raman spectroscopy of many organic pigments.

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