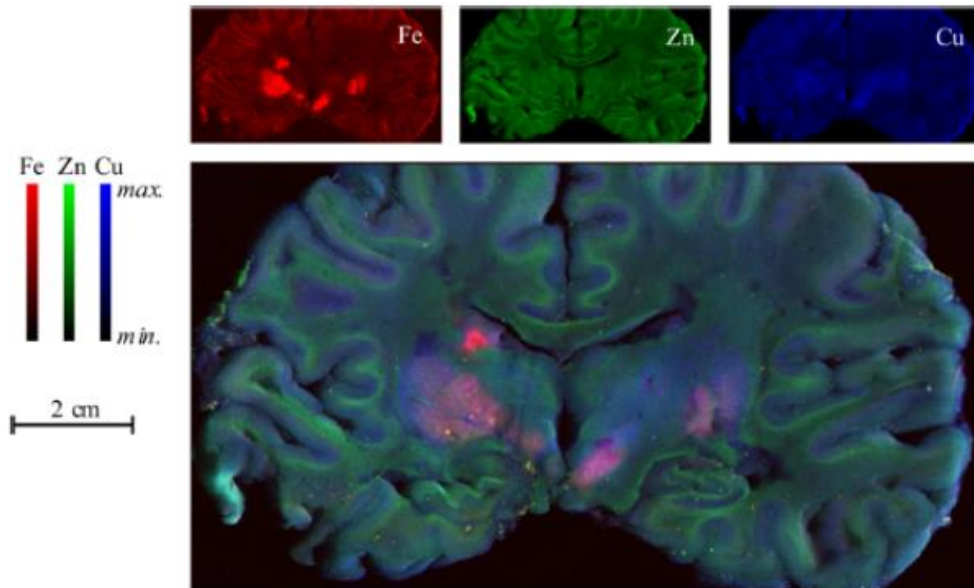


# PHYSICS COLLOQUIUM



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## **Medical and Biological Investigations using Synchrotron Radiation**

### **Abstract**

There are more than 50 synchrotron facilities worldwide supporting cutting-edge scientific research and industrial applications. Discovered in the 1940s, synchrotron radiation (SR) is produced by bending trajectories of ultra-relativistic electrons in periodic magnetic field structures called wigglers and undulators. Extreme SR brilliance in the x-ray region allows the formation of highly collimated intense monoenergetic x-ray beams which are difficult or impossible to achieve using current lab-based instrumentation. Employing various experimental techniques, these capabilities allow measurements of physical and chemical properties of samples on spatial scales ranging from a few micrometers down to atomic scale. This talk will briefly describe the working principles and design of a synchrotron and SR production. The physical processes behind several x-ray techniques often employed in medical and biological investigations will be introduced. Presentation of several biomedical research studies will follow highlighting the scientific insight advantage brought by SR techniques.

**3:00 p.m. - 4:30 pm, Friday, September 30<sup>th</sup>,**  
**In-Person: McLane 162**