MORGAN STATE UNIVERSITY
INTERDISCIPLINARY SEMINAR SERIES
Presents:

**SPEAKER (S):** Dr. Fasil Abebe, Lecturer, Dept. of Chemistry, Morgan State University  
**TOPIC:** Optical Sensors for the Detection of Metal Ions, Anions and Nerve Gas Mimics via Fluorescein and Rhodamine Derivatives  
**DATE/TIME:** February 25, 2016  
**Time:** 3:45 P.M.  
**PLACE:** Traveler’s Auditorium (125 Dixon Research Center)

**ABSTRACT:**
Trace element detection of metals, for example, iron, copper and zinc, are important in biological systems and in the environment. Many of us are aware that our cells contain metal ions that are “tied” up in proteins. However, chelatable or “free” trace elements can also be found in small quantities, and can have a negative impact on our bodies. Despite the increasing surge in developing sensors for metals, anions and nerve gas agents, efficient detection is still remains a challenge. Among the various sensors developed so far, fluorescence sensors play an important role due to their simplicity. I design fluorescein and Rhodamine based chemosensors for Fe$^{3+}$, Co$^{2+}$, Ni$^{2+}$ and Cu$^{2+}$, which exhibit highly selective “off-on” behavior in both absorption and emission, attributed to the transformation of a colorless, nonfluorescent spirolactam form to its colorful, fluorescent, ring-open amide equivalent. This study finds the reversibility of the sensors that bind to the ions, as indicated by the bleaching of color when the experiment extracts the metals with EDTA.

**BIOGRAPHY:** Dr. Fasil Abebe completed his Ph.D. from Western Michigan University and his MSc from Addis Ababa University. He has been a full time faculty member in the chemistry department at MSU since August 2015. He also served as a visiting assistant professor in the department of chemistry and Biochemistry at Houghton College from 2013-2015. Dr. Abebe involved in several research projects for his postdoctoral work at WPI including metal organic frame work (MOF) gas sensors, photo-cages for metal ion signaling in cells and fluorescent polymer metal sensors. He has published several papers on fluorescent and electrochemical sensors for nerve gas mimics, anions and biologically important metal ions. He also presented his research work at regional, national and international conferences. Dr. Abebe teaches courses in both undergraduate and graduate program.

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