

## Sum frequency generation microscopy of surfaces

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Sum frequency generation spectroscopy (SFG) is a useful technique to study molecular properties of surfaces. As a second-order technique it is uniquely sensitive to the average organization of molecules at the surface. However, as most surfaces are spatially heterogeneous, it is difficult to interpret the spectrum as single domain. The development of SFG into a microscopy has allow a more detailed and accurate analysis of the spatio-spectro-temporal evolution of the surface chemistry. The SFG microscope development will be presented, as well as the use of compressive sensing and the application toward corrosion inhibition and self-assembled monolayers.



**Steven Baldelli** received his B.S. degree from Framingham State College in Massachusetts in 1992 and his Ph.D. from Tufts University in 1998 under the direction of Mary Shultz. After spending three years at the University of California, Berkeley, with Gabor Somorjai and Phil Ross, he moved to University of Houston, where he is now an associate professor of chemistry. He is also a visiting professor at the Royal Institute of Technology in Stockholm, Sweden. His interests center on using linear and nonlinear spectroscopic and microscopic methods to study surface chemistry problems including liquid and solid interfaces of ionic liquids, self-assembled monolayers, electrochemical interfaces, and problems in corrosion.