



Carlo U. Segre

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Professional Preparation

• University of California, San Diego	Physics	Ph.D.	1981
• University of California, San Diego	Physics	M.S.	1977
• University of Illinois, Urbana-Champaign,	Physics	B.S.	1976
• University of Illinois, Urbana-Champaign,	Chemistry	B.S.	1976

Appointments

• Interim Chair, Department of Chemistry, Illinois Institute of Technology (IIT)	2016-present
• Duchossois Leadership Professor, Illinois Institute of Technology	2011-present
• Director, Center for Synchrotron Radiation Research and Instrumentation, IIT	2012-present
• Associate Dean, Graduate College, IIT	2002-2012
• Professor of Physics, IIT	2001-present
• Deputy Director, Materials Research Collaborative Access Team	1994-present
• Assoc. Chair, Dept. of Biological, Chemical and Physical Sciences	1993-1999
• Staff Associate, Intl. Centre for Science and High Technology., Trieste, Italy	1990-1993
• Visiting Senior Scientist, Intl. Centre for Theoretical Physics, Trieste, Italy	1989-1990
• Associate Professor of Physics, IIT	1989-2001
• Assistant Professor of Physics, IIT	1983-1989
• Postdoctoral Research Fellow, Rutgers University	1981-1983

Awards

• Fellow, American Association for the Advancement of Science	2013
• Fellow, International Center for Diffraction Data	2006
• IIT Sigma Xi Research Award, Senior Faculty Division	2014

Service

• Sigma Xi, the Scientific Research Honors Society:	
Director, North Central Region	2016-present
Executive Committee member	2017-present
• International Center for Diffraction Data:	
Chair, Education Subcommittee	2005-present
Member, Scholarship Committee	2006-present
• Advanced Photon Source: Beam Time Allocation Committee	2007-present
• Proposal Reviewer for SSRL & CLS	ongoing
• Department of Energy:	
SSRL Triennial Review Panel Member	2014
SSRL Triennial Review Panel Member	2017

Interests

After my initial experiences with synchrotron radiation experiments as a postdoctoral researcher, I joined IIT as an Assistant professor and was selected as the university's representative on the Argonne 6 GeV Synchrotron Committee. In subsequent years, I have devoted significant effort to building IIT's presence in the Synchrotron Radiation community. These activities have included:

- I am a founding member and current Director of IIT's Center for Synchrotron Radiation Research and Instrumentation (CSRRI) which built 5 APS beamlines and is currently operating 3 at Sectors 10 & 18;
- I have been on the Local Organizing Committee of the *1st International Conference on Synchrotron Radiation in Materials Science* (1996); the *10th International Conference on X-ray Absorption Fine Structure* (1998); and the *5th International Conference on Synchrotron Radiation in Materials Science* (2006);
- Since 1994, I have served as the IIT representative to the MRCAT Executive Committee, as Deputy Director of MRCAT and as supervisor to all of the MRCAT staff;
- I have been co-organizer and instructor of the APS/IIT EXAFS Summer School for the past 8 years and I have regularly offered an online course on Synchrotron Radiation to IIT students and students in other institutions around the world.

I have been heavily involved in developing instrumentation for use at synchrotron radiation facilities, including the MRCAT beamline, a bent Laue analyzer for fluorescence XAFS, a beam cleaner for harmonic rejection, and *in situ* and *operando* electrochemical cells for the study of catalysis, fuel cells and batteries.

My current research projects include *in situ* XAFS on solid state and flow batteries and working fuel cells, phosphors, dilute magnetic semiconductors, and multiferroics. I have also been applying high energy x-ray diffraction and tomography to study cultural heritage artifacts. A recent ARPA-e award has taken my research in the direction of developing a new format of battery, combining the advantages of solid state and flow batteries, for electric vehicles.

As Deputy Director and Operations Manager of MRCAT, I have had the opportunity to act as a Beamline Scientist as well as a manager. In these roles, I am often approached by new users who wish to perform EXAFS experiments and need assistance in designing their experiments and later analyzing their data. Such collaborations have given me perspective on the needs of both General and Partner Users of the APS. The APS Upgrade promises to open new opportunities for the General User community and it is important to start planning immediately to ensure that all APS beamlines will be upgraded to take advantage of the enhanced source. This planning needs to extend beyond hardware to software that will enable users to effectively manage the higher throughput of data.