

Presentation of the Mineralogical Society of America Award for 2010 to Benjamin Gilbert

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It is a special pleasure for me, and a distinct honor, to introduce the 2010 MSA awardee, Benjamin Gilbert.

Liking science from early youth, Ben started his physics studies at Cambridge University, ultimately selecting a project that connected biology with physics as much as possible: the interaction of proteins with surfaces. This was to be, a portentous decision. Upon graduating he found less than enthusiastic interest from possible physics graduate schools in the U.K., a mutual consideration as traditional condensed matter physics did not appeal to him. But serendipity intervened, as the scientist now known as Pupa Gilbert, working in Giorgio Margaritondo's group, was looking to hire a biophysics Ph.D. student at the Swiss Federal Institute of Technology at Lausanne (EPFL). Her interest was in developing a new therapy for brain cancer, and to this end she had designed and built the synchrotron spectromicroscope, MEPHISTO. Ben enthusiastically embraced Pupa's project and the challenges of using a cutting-edge X-ray method to understand the biochemical behavior of novel drug compounds.

As Ben was completing his thesis at the EPFL, Pupa took a full-professorship at UW-Madison at the end of 1999. In 2000, Ben accepted Pupa's offer for a post-doctoral position at UW-Madison to join a few collaborations in geo- and biogeochemistry that Pupa had established. These included research with John Valley on silicate inclusions in zircons and with Ken Nealson's group at the Jet Propulsion Laboratory on banded iron formations. Ben's work at the UW synchrotron radiation center (SRC) brought him his first award recognition. An important collaboration for both Ben and Pupa at UW-Madison was with Jill Banfield, who had just made the exciting discovery of zinc sulfide nanoparticle precipitating bacteria.

When Jill moved to UC Berkeley she soon offered a post-doctoral position to Ben so he moved to Berkeley in 2002. Jill was entranced with the unusual properties of ZnS nanoparticles, and in the ensuing studies at Berkeley within Jill's group, Ben was the crucial element of brilliance and critical mass needed to mount a major thrust in ZnS nanoscience. This resulted in a set of milestone papers on nanoparticle structure and the ef-

fect of strain and surface ligands, structural transformations of nanoparticles, electronic structure of nanoparticles, aggregation states of nanoparticles, and other areas.

In 2004, Ben was seeking a permanent job and Jill and myself advocated for a new scientist position at LBNL into which Ben could be hired. The LBNL position motivated Ben to advance into broader areas of nanoscience, including aggregation behavior, while also examining the biological and environmental impact of nanoparticles. About this time the Berkeley Nanogeoscience Center was founded, and a hugely productive team-effort between UC Berkeley and LBNL emerged, sharing facilities, talent, and perspectives.

Ben and Pupa's friendship blossomed as Ben worked in Berkeley, eventually resulting in their marriage in 2006.

This brings me to the present, where Ben is currently embarked within our center on another ambitious thrust into largely or completely unexplored areas of nanogeoscience: solving nanoparticle structures, seeking the molecular structure of mineral surfaces undergoing redox reactions, and performing the first experiments of their kind on ultrafast electron transfer kinetics in iron oxide nanoparticles—a critical step in the reductive dissolution process.

Throughout his career Ben has been able to move into these new areas with a facility I have not seen in any young investigator. Besides his keen intellect, gracious manner, and unkempt hair, he is a fearless innovator and risk-taker, something generally seen only much later in very secure tenured professors, and very rarely in new soft-money funded scientists at national laboratories. This fearlessness comes from great confidence, yet with personal humility; a track record of performance where any subject seems within reach; and endless enthusiasm. It is wonderful to have Ben as a colleague, indeed in the adjacent office, and I can say I have no doubts that he will continue to advance mineralogical sciences into exciting areas that I anticipate will bring new lifeblood into our disciplines.

With this introduction it is my honor to present Benjamin Gilbert to you all as recipient of the 2010 Mineralogical Society of America Award.