1108-00-229 **Ge Wang*** (ge-wang@ieee.org), Biomedical Imaging Center/Cluster, Rensselaer Polytechnic Institute, Troy, NY 12180. *Future of Multi-modality Imaging.* Preliminary report.

We published the first papers on interior tomography and omni-tomography for grand fusion of all relevant tomographic modalities ("all-in-one") to acquire different datasets simultaneously ("all-at-once") and capture multi-physics interactions ("all-of-couplings"), with simultaneous CT-MRI as a special example. Integrated multimodality imaging systems such as PET-CT and MRI-PET gained acceptance as valuable clinical and research tools after initial skepticism, but CT-MRI has not been attempted largely due to technical challenges, despite its greater promise. CT offers a nearly ideal map of morphology at fine resolution and high speed. MRI captures functional, flow-sensitive, and tissue-specific signals in excellent contrast. Should it be funded to build a simultaneous/contemporaneous CT-MRI scanner, we would be uniquely equipped to image intrinsic complexity and dynamic character of real biological and pathological processes, especially in non-contrast/contrast-enhanced cardiovascular and oncologic applications. In this presentation, we particularly discuss the potential of simultaneous/contemporaneous CT-MRI and collaborative opportunities. (Received January 14, 2015)