

# High-resolution spectral micro-CT: system design, reconstruction method and preliminary results

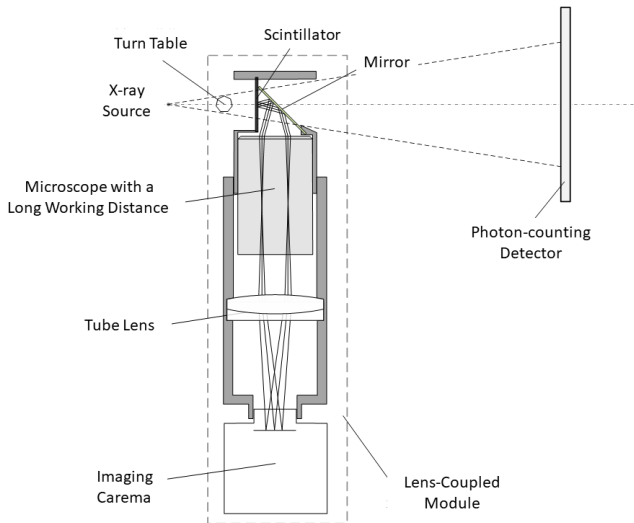
Qian Wang<sup>1</sup>, Yining Zhu<sup>2</sup>, Shiwo Deng<sup>2</sup>, Huitao Zhang<sup>2</sup>,  
Hengyong Yu<sup>1</sup>

*(1) University of Massachusetts Lowell, Lowell, MA*

*(2) Capital Normal University, Beijing, China*

Conference on Modern Challenges in Imaging  
August 6th, 2019

# High-resolution Spectral Micro-CT System



**Figure:** Illustration of a spectral micro-CT system with both optical-magnification and energy-identification mechanisms.

## Hybrid-data based Multi-constraint Optimization Framework

$$\min_{\substack{f_{LCD}, f_{PCD}^c \\ c \in \{1, 2, \dots, C\}}} \left\{ \mathcal{D}_{LCD}(f_{LCD}, P_{LCD}) + \sum_{c=1}^C \mathcal{D}_{PCD}(f_{PCD}^c, P_{PCD}^c) + \mathcal{R}_{LCD}(f_{LCD}) \right. \\ \left. + \sum_{c=1}^C \mathcal{R}_{PCD}(f_{PCD}^c) \right\} \text{ s.t. } \mathcal{C}(f_{LCD}, f_{PCD}^c), c \in \{1, 2, \dots, C\}$$

## Decomposed Material Images

