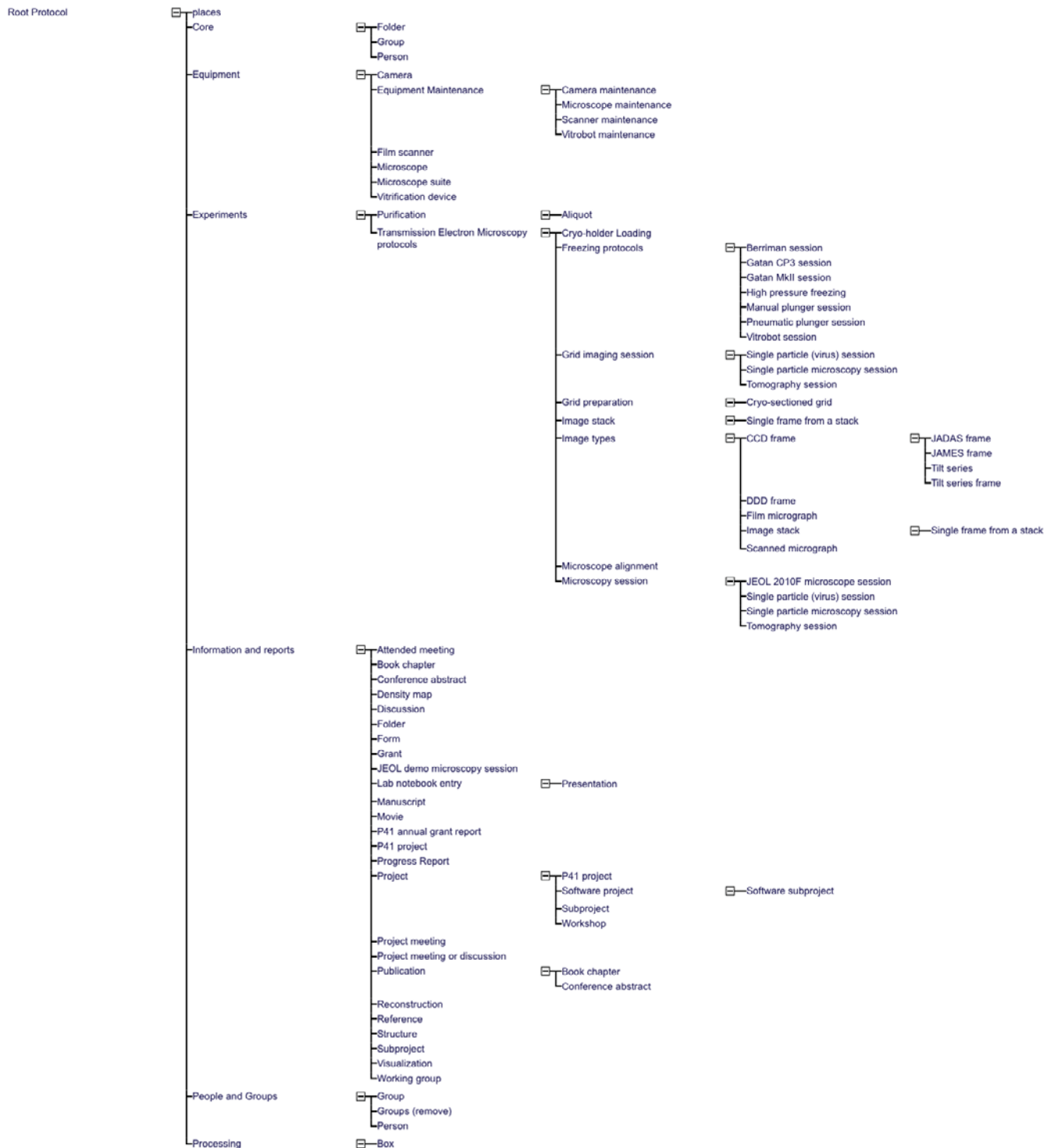**Supplementary Figure 1.** Tree view of the complete included EMEN2 parameter ontology. In addition to generic parameters common to any scientific endeavor, this includes common data types and parameters used in cryo-EM projects, including meta-data from image headers, microscope and freezing apparatus settings, reconstruction metadata, etc.

Root Protocol

- places
  - Core
    - Folder
    - Group
    - Person
  - Equipment
    - Camera
    - Equipment Maintenance
      - Camera maintenance
      - Microscope maintenance
      - Scanner maintenance
      - Vitrobot maintenance
    - Film scanner
    - Microscope
    - Microscope suite
    - Vitrification device
  - Experiments
    - Purification
      - Aliquot
    - Transmission Electron Microscopy protocols
      - Cryo-holder Loading
      - Freezing protocols
        - Berriman session
        - Gatan CP3 session
        - Gatan MkII session
        - High pressure freezing
        - Manual plunger session
        - Pneumatic plunger session
        - Vitrobot session
      - Grid imaging session
        - Single particle (virus) session
        - Single particle microscopy session
        - Tomography session
      - Grid preparation
        - Cryo-sectioned grid
      - Image stack
        - Single frame from a stack
      - Image types
        - CCD frame
          - JADAS frame
          - JAMES frame
          - Tilt series
          - Tilt series frame
        - DDD frame
        - Film micrograph
        - Image stack
          - Single frame from a stack
        - Scanned micrograph
      - Microscope alignment
      - Microscopy session
        - JEOL 2010F microscope session
        - Single particle (virus) session
        - Single particle microscopy session
        - Tomography session
  - Information and reports
    - Attended meeting
    - Book chapter
    - Conference abstract
    - Density map
    - Discussion
    - Folder
    - Form
    - Grant
    - JEOL demo microscopy session
    - Lab notebook entry
      - Presentation
    - Manuscript
    - Movie
    - P41 annual grant report
    - P41 project
    - Progress Report
    - Project
      - P41 project
      - Software project
        - Software subproject
      - Subproject
      - Workshop
    - Project meeting
    - Project meeting or discussion
    - Publication
      - Book chapter
      - Conference abstract
    - Reconstruction
    - Reference
    - Structure
    - Subproject
    - Visualization
    - Working group
  - People and Groups
    - Group
    - Groups (remove)
    - Person
  - Processing
    - Box

Supplementary Figure 2. Tree view of the included EMEN2 protocol ontology. Protocols for common cryo-EM experiments and data types are included. Users can customize these protocols by creating modified versions. For non-cryo-EM use, the cryo-EM portion of the ontology can be easily removed.
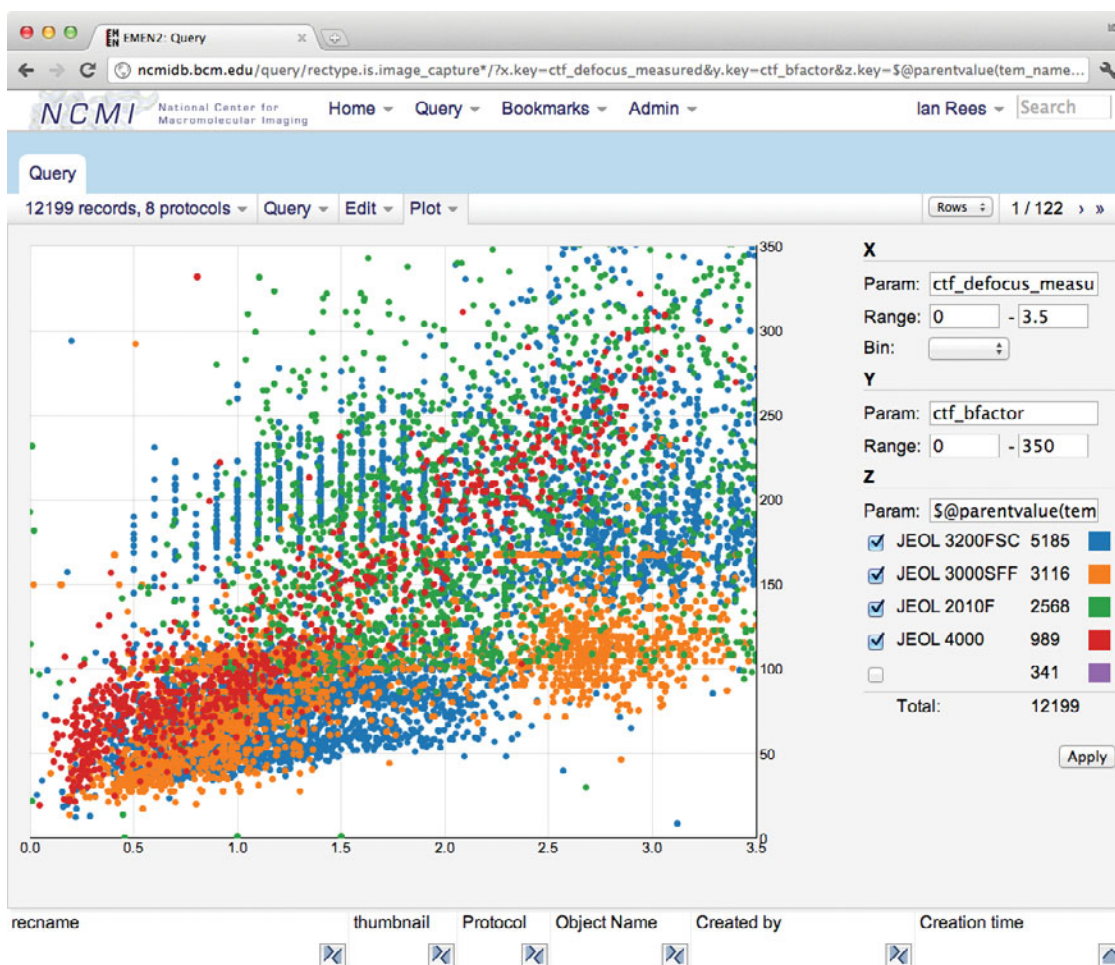
Supplementary Figure 3. Additional plotting examples. This scatterplot of CTF B-Factor versus measured defocus, grouped by the microscope used, shows differences in the quality of data acquired with each instrument. The plot could alternatively be grouped by specimen, microscopist, date, etc., to see if the differences are spurious or something that needs to be seriously investigated. The plot is highly interactive and updates dynamically.
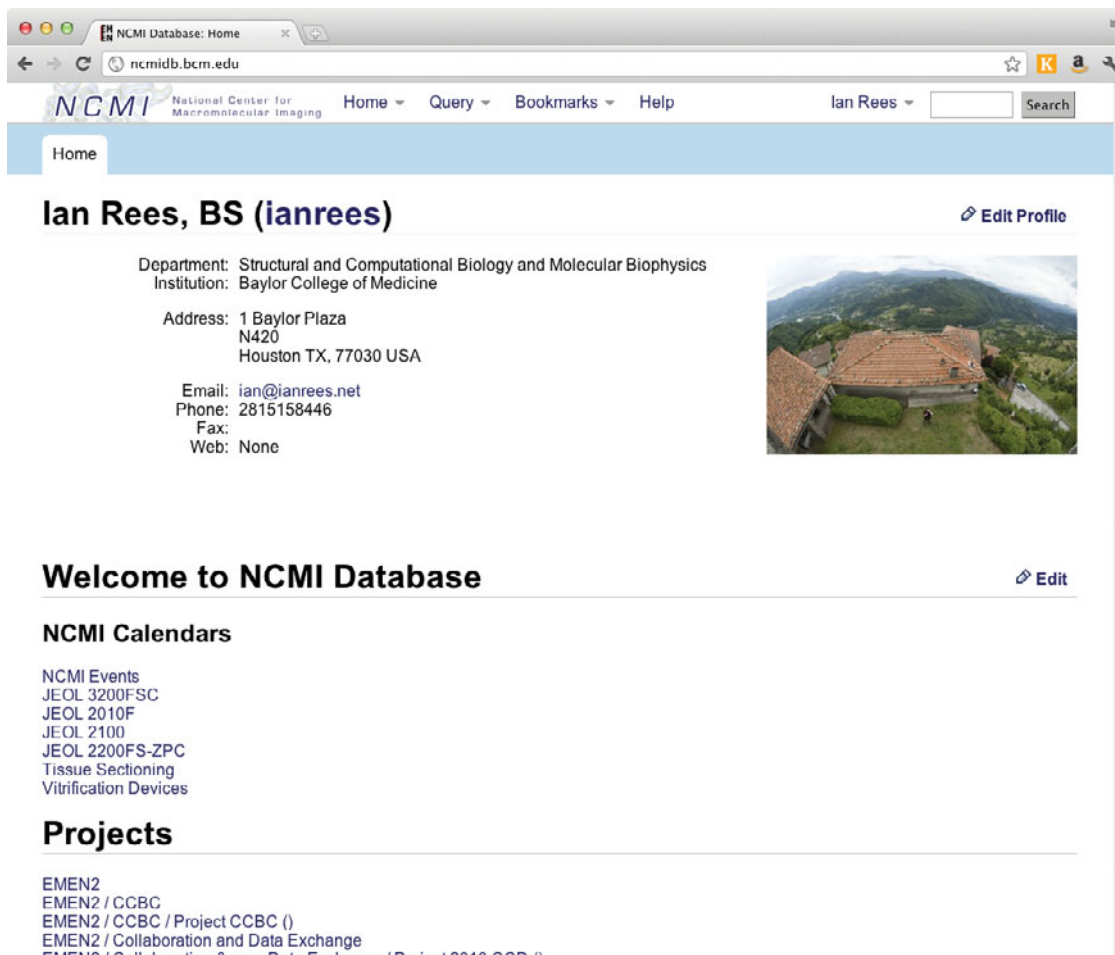
Supplementary Figure 4a. Screenshot tour of additional database features. The main home page features user administration tools, a table of recently created records, and a list of top-level projects.
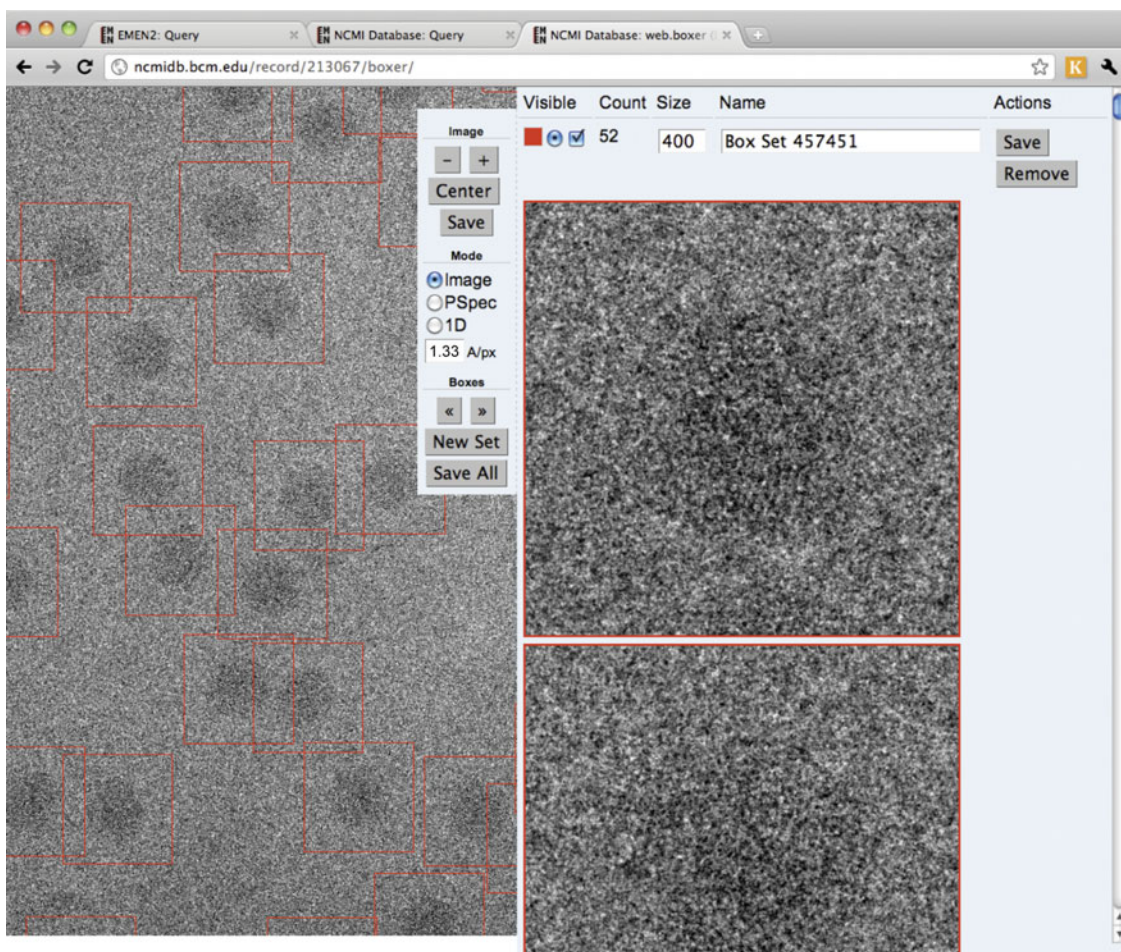
Supplementary Figure 4b. Interactive online particle picker. This tool uses EMAN2 on the server to render the micrographs and boxed particles as tiles that are sent to the browser in real time. The micrograph may be panned and zoomed, and particles are added with a click and removed with a shift-click. The boxed particles appear in the right sidebar. Particle coordinates can be imported and exported from EMAN1 and EMAN2.

Supplementary Figure 4c. Screenshot of the basic query interface for finding records by protocol, user, project, etc.