

# Atomic Data Research and Database Development at NIST

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We present a detailed report on atomic data research and atomic database development at the National Institute of Standards and Technology (NIST) over the last two years (Oct 2017 – Sep 2019). Over this period, the most extensive database at NIST, the Atomic Spectra Database (ASD), had two major (5.5 and 5.6) and seven minor updates which brought the total number of critically evaluated energy levels and spectral lines in ASD to 111,865 and 276,555 respectively, with almost 118,000 transition probabilities. The Laser Induced Breakdown Spectroscopy (LIBS) database was improved and a number of bugs were corrected as well. The bibliographic databases are updated regularly with the total number of classified references exceeding 20,000. All these databases are extensively used by the community and we will present the corresponding access statistics.

Our experimental program on measurement and analysis of atomic spectra has received a significant boost due to the installation of a state-of-the-art x-ray transition-array-sensor microcalorimeter on the NIST Electron Beam Ion Trap (EBIT). The very first measurements of spectra from highly-charged high-Z ions show excellent spectral resolution and sensitivity of the spectrometer. We will also present high-precision spectroscopic measurements from neutral and low-charged ions. Finally, a detailed report will be given on our work on generation of recommended electron-impact excitation and ionization cross sections for neutral Be which is of high importance for the ITER spectroscopy.