**The NSFED Stellar and Exoplanet Hosting Star Service**


(Michelson Science Center, Infrared Processing and Analysis Center, California Institute of Technology)

**Abstract & Introduction:** The NASA Star and Exoplanet Database (NSFED) is a general purpose stellar archive with the aim of providing support for NASA’s planet finding and characterization goals, stellar astrophysics, and the planning of NASA and other space missions. There are two principal components of NSFED: a database of 140,000 nearby stars and exoplanet-hosting stars, and an archive dedicated to high precision photometric surveys for transiting exoplanets. We present a summary of the NSFED stellar database, functionality, tools, and user interface. NSFED currently serves the following kinds of data for 140,000 stars (where available): coordinates, multiplicity, proper motion, parallax, spectral type, multiband photometry, radial velocity, metallicity, chromospheric and coronal activity index, rotation velocity/period, infrared excess, etc. Furthermore, the following derived quantities are given wherever possible: distance, effective temperature, mass, radius, luminosity, age, space motions, and physical/angular dimensions of habitable zone. Queries to NSFED can be made using constraints on any combination of the above parameters. In addition, NSFED provides tools to derive specific inferred quantities for the stars in the database, cross-referenced with available extra-solar planetary data for those host stars.

**The NSFED Services**

- **Stellar Services**
  - Data related to relatively bright nearby stars
  - All known planet-hosting stars
  - Query for individual stars or by stellar/planetary parameters
  - Images and spectra
- **Exoplanet Services**
  - Data related to known exoplanets
  - Photometric light curves of transiting exoplanets
  - Dedicated interface related to exoplanet transit surveys (see poster by von Braun et al.)

Below: Plot of predicted astrometric wobble for an Earth-sized planet in the habitable zone vs. the apparent V magnitude of the stars, generated using data served by NSFED. The stars are sorted by activity levels from the R’(HK) index, S index, and X-ray luminosity.

The three figures shown below are examples of the data currently within NSFED. These include (from left to right) a coronographic image of Gj 740 from Palomar, the lightcurve of the transiting exoplanet TrES-2, and the N2K spectrum of HD 804.

Above: An example NSFED overview page, in this case resulting from a query on HD 189733.

Above: Aitoff projection of the contents of NSFED. Red dots: dwarf stars (for clarity, the giant stars are not plotted); large blue dots: exoplanet hosting stars; large green plus signs: stars with radial velocity curves or photometric light curves; open black squares/diamonds: stars with images/spectra. For an explanation of the remaining features, see companion poster on NSFED Exoplanet Transit Survey Service (von Braun et al.).

NSFED was developed using the NASA grant 2003 TPF-FS. Additional funding for NSFED was provided by the Michelson Science Center (MSC).