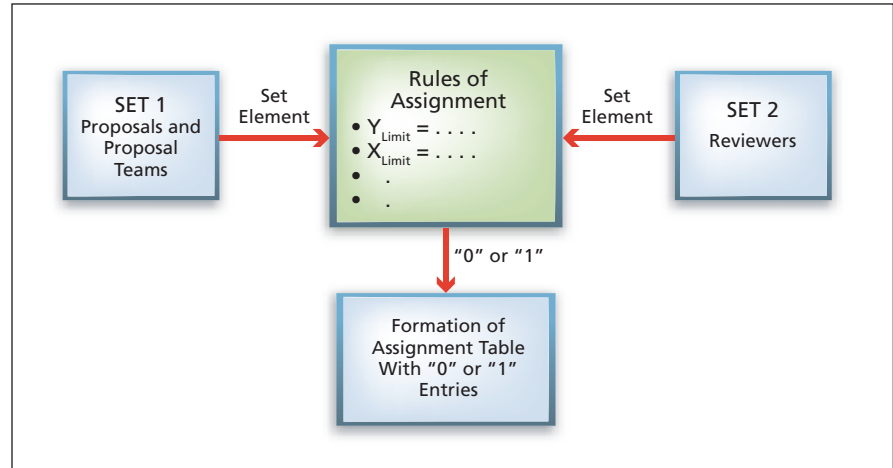


## Automated Assignment of Proposals to Reviewers

NASA's Jet Propulsion Laboratory, Pasadena, California

A computer program automates the process of selecting unbiased peer reviewers of research proposals submitted to NASA. Heretofore, such selection has been performed by manual searching of two large databases subject to a set of assignment rules. One database lists proposals and proposers; the other database lists potential reviewers. The manual search takes an average of several weeks per proposal. In contrast, the present software can perform the selection in seconds. The program begins by selecting one entry from each database, then applying the assignment rules to this pair of entries. If and only if all the assignment rules are satisfied, the chosen reviewer is assigned to the chosen proposal. The assignment rules enforced by the program are (1) a maximum allowable number of proposals assigned to a single reviewer; (2) a maximum allowable number of reviewers assigned to a single proposal; (3) if the proposing team includes a member affiliated with an industry, then the reviewer must not be affiliated with any in-



The **Assignment Process** begins with selection of an element from Set 1 and from Set 2 and follows a set of rules to avoid biases and other problems in proposal reviews.

dustry; and (4) the reviewer must not be a member of the proposing team or affiliated with the same institution as that of a member of the proposing team.

*This program was written Faiza Lansing and Anil Kantak of Caltech for NASA's Jet*

**Propulsion Laboratory.** Further information is contained in a TSP (see page 1).

*This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-40902.*

## Array-Pattern-Match Compiler for Opportunistic Data Analysis

NASA's Jet Propulsion Laboratory, Pasadena, California

A computer program has been written to facilitate real-time sifting of scientific data as they are acquired to find data patterns deemed to warrant further analysis. The patterns in question are of a type denoted array patterns, which are specified by nested parenthetical expressions. [One example of an array pattern is  $((>3) 0 (\neq 1))$ : this pattern matches a vector of at least three elements, the first of which exceeds 3, the second of which is 0, and the third of which does not equal

1.] This program accepts a high-level description of a static array pattern and compiles a highly optimal and compact other program to determine whether any given instance of any data array matches that pattern. The compiler implemented by this program is independent of the target language, so that as new languages are used to write code that processes scientific data, they can easily be adapted to this compiler. This program runs on a variety of different com-

puting platforms. It must be run in conjunction with any one of a number of Lisp compilers that are available commercially or as shareware.

*This program was written by Mark James of Caltech for NASA's Jet Propulsion Laboratory.* Further information is contained in a TSP (see page 1).

*This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (626) 395-2322. Refer to NPO-42096.*

## Pre-Processor for Compression of Multispectral Image Data

NASA's Jet Propulsion Laboratory, Pasadena, California

A computer program that pre-processes multispectral image data has been developed to provide the Mars Exploration Rover (MER) mission with a means of exploiting the additional correlation present in such data without appreciably increasing the complexity of compressing the data. When used in con-

junction with ICER, a previously developed image-data-compression program, this program enables improved compression of multispectral images, compared to that achievable by use of ICER alone. As such, it is a straightforward means of achieving much of the gain possible from exploiting spectral correlation.

This preprocessor software accommodates up to seven images that are different spectral bands of the same scene. The software performs an approximate discrete cosine transform (DCT) pixel-wise across the spectral bands. The software is written for speed; in particular the DCT operation performs only inte-