# Comprehensive Analysis of Neptune's Features

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Total Budget Amount: $85,000

## Abstract

Hubble took an amazing data set of Neptune in nine GO programs between 1994 and 2006, consisting of 408 WFPC2 exposures with several filters present in each program. The PIs of these programs, Hammel, Sromovsky, and Rages, published a variety of results about Neptune's atmosphere based on each program. However, the typical size of the grants for each program did not allow all scientific questions of these rich data sets to be addressed.

I propose to analyze these 400 images to create a consistent data set spanning 12 years, and I will make even the intermediate results available, such as 400 consistently calibrated images. The combined data set will then be able to address more far reaching questions than could be done by single data sets. Whereas previous studies focused on only a few center-to-limb measurements for a limited selection of latitudes and wavelengths, I will investigate the whole data set and analyze 16,000 center-to-limb curves. I will use the principal component analysis and various statistical tests to find the hidden variations on Neptune. I created software for a similar project on Hubble's Saturn images. I am ready to adapt and apply it to Hubble's Neptune images.

The huge number of variable features on Neptune contain an ideal probe about atmospheric dynamics. Previous investigations have only scratched pieces of the surface of this treasure. It is time for a comprehensive study of the whole data to discover fundamenatal insights about atmospheric dynamics.

## Investigators:

| | Investigator | Institution | Country |
|---|---|---|---|
| PI | Dr. Erich Karkoschka | University of Arizona | USA/AZ |

Number of investigators: 1

## Dataset Summary:

| Instrument | No. of Datasets | Retrieval Method | Retrieval Plan |
|---|---|---|---|
| WFPC2 | 408 | CD | Prefer all data at the beginning of the work, or at least half at the beginning and the rest within two months. |