

# The Status of Women at IPAC

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## Introduction

Inspired by the recent reports on the status of women at Caltech, MIT and STScI, we initiated a similar study at IPAC. The complete study is envisioned as a combination of objective statistical data and an anonymous web-based survey where both men and women are given the opportunity to comment on questions relating to the climate of the work environment and other issues that are difficult to capture through simple statistics. This study is a work in progress and we present here preliminary results based purely on the more objective statistics collected so far.

*A Brief History of IPAC.* The Infrared Processing and Analysis Center (IPAC) is NASA's multi-mission center of expertise for long-wavelength astrophysics. It consists of a team of scientists, technical staff (covering software development, data analysis, and system operations), and administrative staff that works with JPL and Caltech to support NASA-sponsored missions/programs. IPAC was founded in 1986 to support IRAS and has since grown tremendously to support such missions as 2MASS, MSX, ISO, and SIRTF. IPAC is slowly expanding its role from its original purely infrared mandate to currently support GALEX as well as Herschel, SIM and TPF in the future. IPAC is the home of the SIRTF Science Center (SSC), the Michelson Science Center (MSC), the Infrared Science Archive (IRSA), and the NASA Extragalactic Database (NED).

## IPAC Through Time

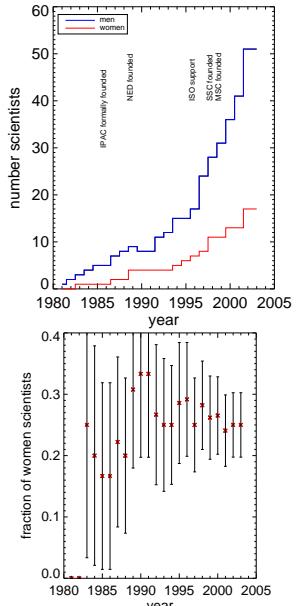


Figure 1: Science staff at IPAC as a function of time. The top figure portrays absolute numbers; the bottom figure shows the fraction of women in a given year.

Disregarding the early years of IPAC where the distribution is affected by small number statistics, the fraction of female scientists at IPAC appears to be constant within errors at  $\sim 25\%$ . This is unusually high compared to the fraction reported for STScI, Caltech, and MIT where the typical values are closer to 10–15%. In addition, the NSF reports that 26% of all astronomy Ph. D.s were awarded to women in 2000. Considering that there is likely to be some attrition of women during the postdoc stages (the “leaky pipeline”) and that the fraction of PhDs awarded to women was lower in the past, IPAC appears to employ an unusually high number of women (which is great!).

IPAC has very high retention rates. Throughout IPAC's history,  $<15$  men and  $<3$  women scientists have left IPAC.

## Science Staff Today

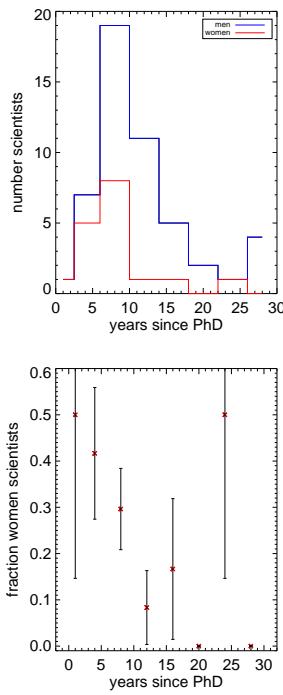


Figure 2: The distribution of scientists currently at IPAC as a function of years since Ph. D. The top figure portrays absolute numbers; the bottom figure shows the fraction of women.

Figure 2 shows the distribution of the current science staff at IPAC as a function of years since Ph. D. (an approximate indicator of seniority). However, IPAC scientists have a great diversity of backgrounds, including periods of non-astronomy jobs, going back to school, or a primarily non-science job track. The fraction of women declines as years of experience increases. IPAC has two tracks for science staff: the *research* track, which is nominally 50% project work and 50% science, and the *staff* track, which is nominally 80% project and 20% science. Within each track, there are three seniority levels: *Assistant*, *Associate*, and *Senior*. Tables 1 and 2 show the number of men and women in each track and each seniority level. The fraction of men and women in each track is identical. In Table 2, note that the small fraction of women at the associate level might be explained by the mean level of experience as represented in the median years since Ph. D.

Table 1: Number of people on research and staff tracks.

track	research	staff
number of men	21	30
number of women	7	10

Table 2: Number of people per seniority level.

level	# of men	# of women	men: median yrs since PhD	women: median yrs since PhD
senior	7	2	18	15.5
associate	18	2	14	12.5
assistant	26	13	7.5	7

## IPAC Staff Today

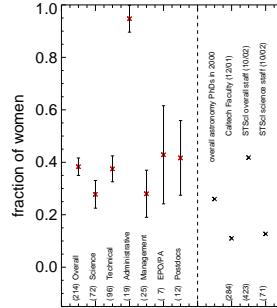


Figure 3: Fraction of women overall at IPAC as a function of different job categories; the numbers in brackets below each category indicate the total number of people included in each category. Most of the job categories are self-explanatory, except for “technical,” meaning engineers and information technology staff; EPO/PA=Education and Public Outreach/Public Affairs.

Because the sheer number of women in the workplace affects the overall culture, we include in Figure 3 a plot of the fraction of women in various job categories at IPAC. People can be considered in more than one bin, e.g. a scientist who is also a task lead or other type of manager. With the exception of the administrative staff, the fraction of women is constant within errors in each category. For comparison, the following numbers are shown: fraction of women granted astronomy Ph. D.s in 2000 (number from NSF by way of the study of women at STScI), the fraction of women faculty at Caltech in Dec. 2001 (number from study of women faculty at Caltech), and the fraction of women overall and on the science staff at STScI as of Oct. 2002 (numbers from the study of women at STScI).

## Science Staff Salaries

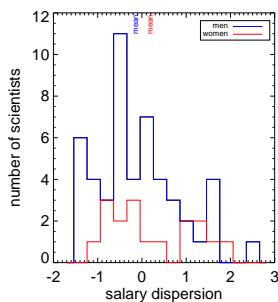


Figure 4: Histogram of salary dispersion data; see text.

IPAC management took all salaries of science staff (not including directorial staff) and sorted them into bins of years since Ph. D. The 67 salaries were distributed into 6 bins, each containing from 8 to 13 numbers. They then computed the average and rms dispersion within each bin, and normalized the deviation of each salary from the average by the rms dispersion in the corresponding bin. The distribution of salaries is not Gaussian, nor even symmetric about the average. The histogram of normalized deviation from the average is shown in Figure 4. The mean value for men is  $-0.08$ , and the mean value for women is  $0.24$ . The two distributions are statistically identical.

## Acknowledgements

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