

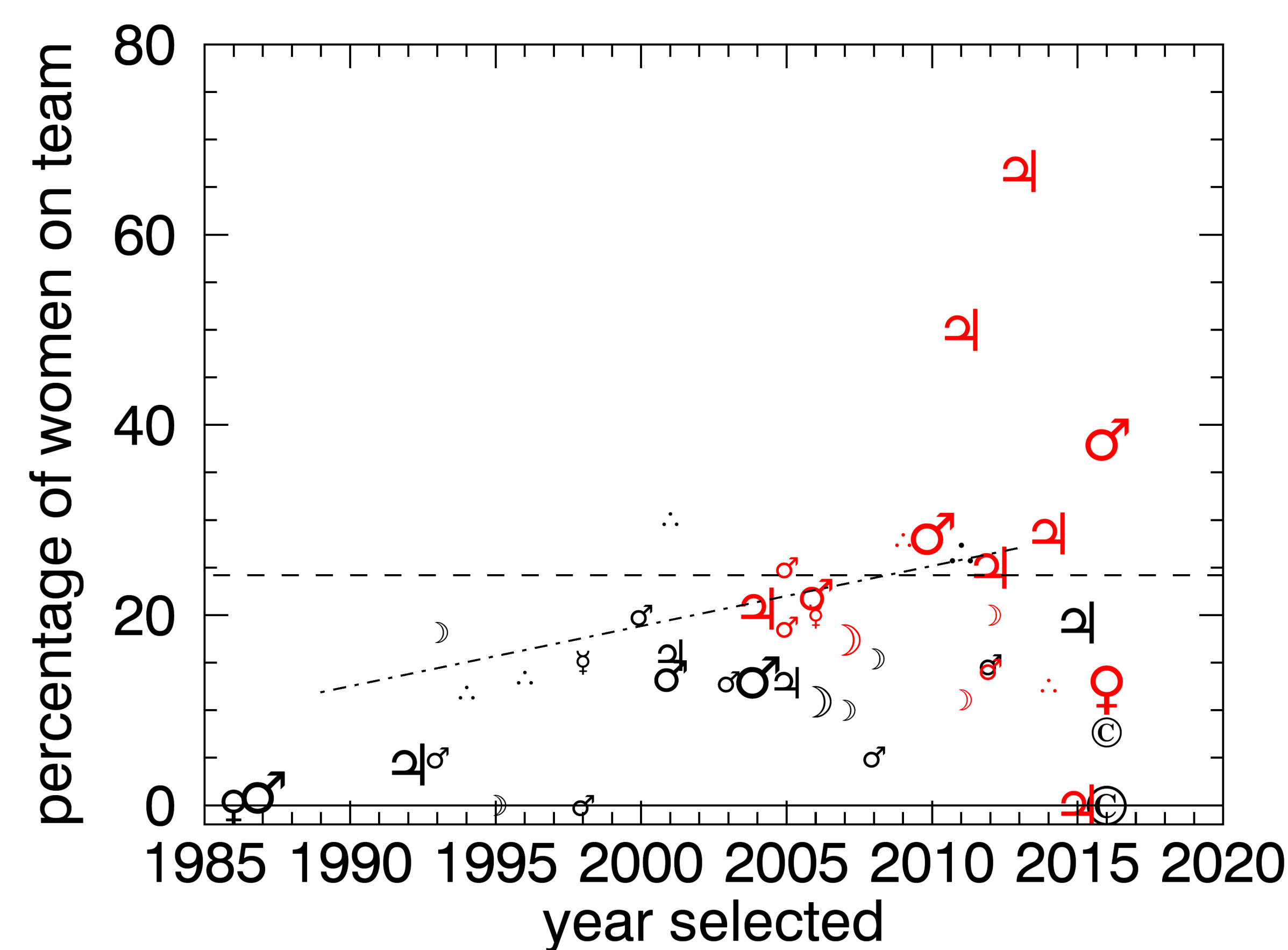
# Historical Trends of Participation of Women Scientists in Robotic Spacecraft Mission Science Teams: Effect of Participating Scientist Programs

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## Introduction

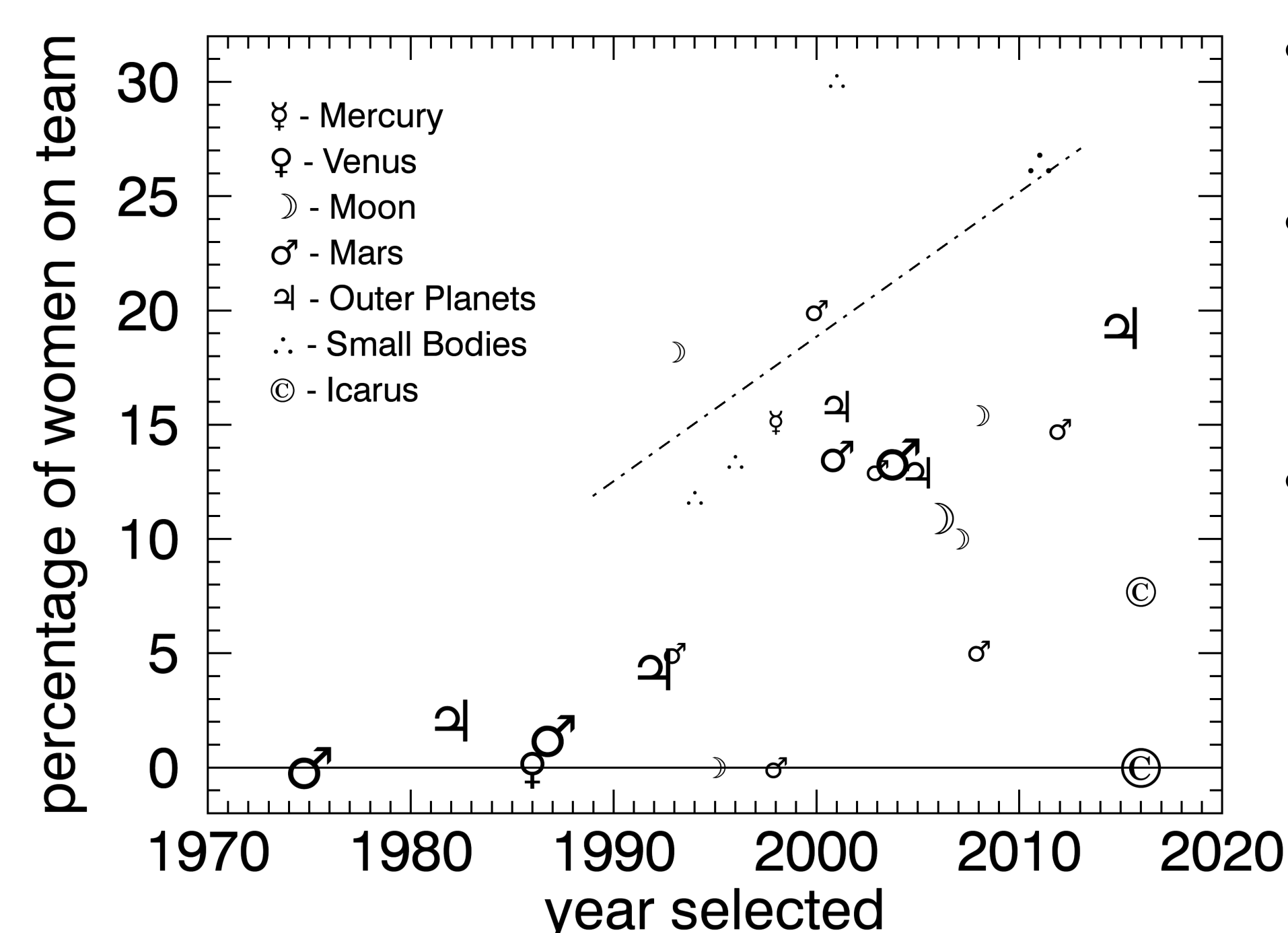
We have added to the work presented last year at DPS. Spacecraft missions and journal editorship are two possible measures of leadership within planetary sciences. We have determined the percentage of women on 5 additional planetary science missions (data shown below) to bring our total to 26 missions over a period of 41 years. We have again compared that to the percentage of women in the field during the missions' selection year. We have also determined the percentage of women in 18 selections of Participating Scientists and Guest Investigators. Finally, we have determined the percentage of women serving as editors for Icarus, as well as their advisory board.

For a description of our methodology, see last year's presentation.



## Including Participating Scientists

Percentages plotted in red are from Participating Scientist and Guest Investigator programs whose results are posted on nspires. The exception is scientists added to Cassini between 1999 and 2009, placed at 2004. The horizontal dashed line represents the average percentage of women in these selections (24.2%,  $\sigma=15\%$ ). It roughly corresponds to the percentage of women in the field circa 2008. This percentage is also substantially higher than the average percentage for original spacecraft mission teams (15.8% post-2001,  $\sigma=6\%$ ).



- Size of symbol  $\sim$  size of mission
- Dash-dot line shows percentage of women in the field
- Only 4/26 (15%) of missions have more women than the average in the field, most are small numbers (2,1,6,14)

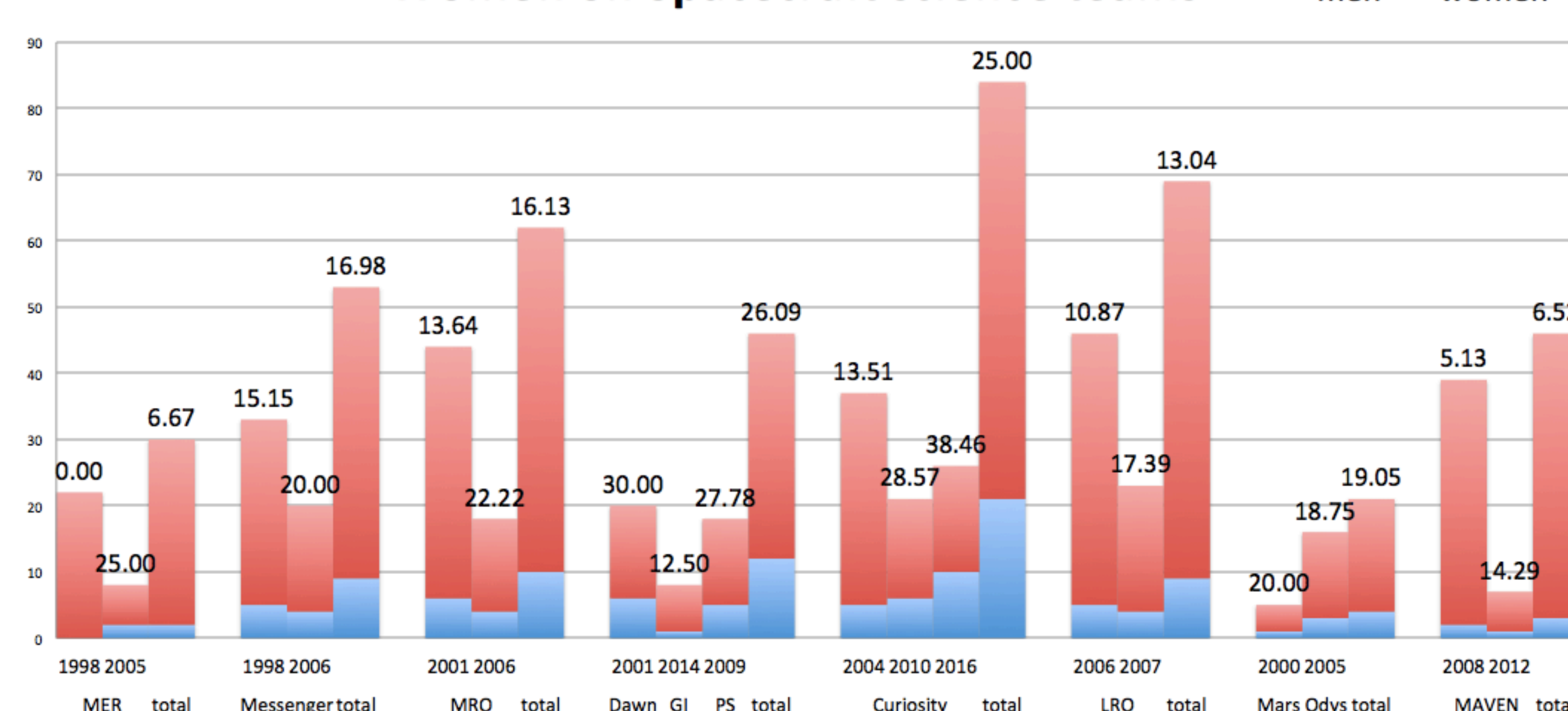
- Since 2001, percentage of women on missions has remained flat (best fit slope = -0.07)
- 2001-2016, average percentage of women on teams 15.8%

## Icarus

- Official journal of the DPS
- Similar to spacecraft missions, we only considered the gender of scientists employed at US institutions
- © represents Icarus editors (larger at 0%), and editors + advisory board (small symbol)
- Even when considering the advisory board, the percentage of women serving as Icarus editors is substantially less than the percentage in the field (7.7% vs. > 25%)

selection year	Launch year	Mission Name	# women	total #	% women	Target	Size
1992	1997	Cassini	5	111	4.3	Outer planets	large
1993	1994	Clementine	2	9	18.2	Moon	small
1993	1996	Mars Pathfinder	1	19	5	Mars	small
2000	2001	Mars Odyssey	1	4	20	Small bodies	small
2003	2007	Phoenix	3	20	13	Mars	small

## Women on Spacecraft science teams

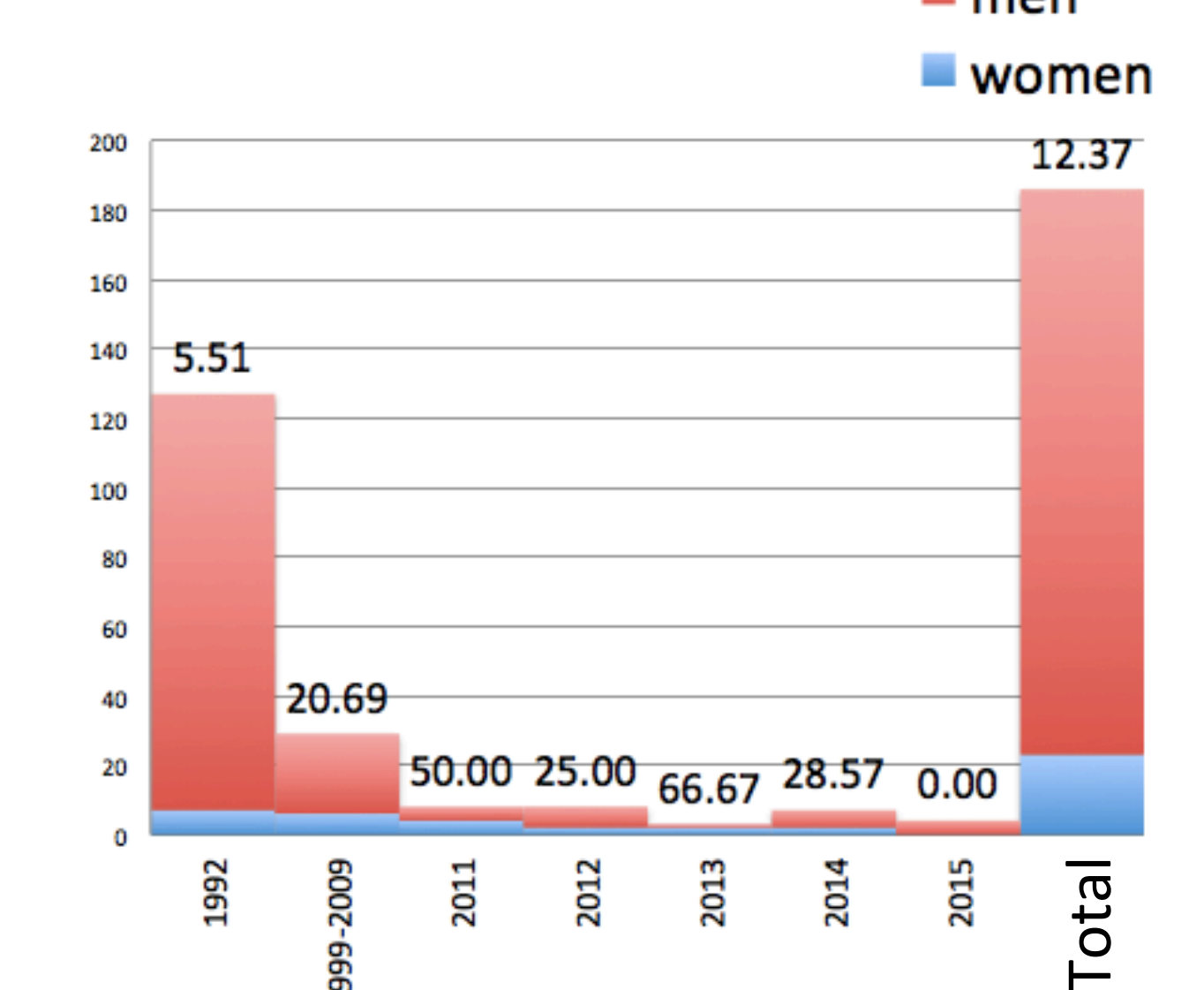


The leftmost bars in each group indicate the originally selected team while the rightmost bar adds all selections, ignoring the fact that the same individual may be counted more than once if there are multiple PS selections.

## Cassini

Due to its large numbers, the Cassini selections are shown separately, at right. Note that records are contradictory in some cases, so the absolute numbers are uncertain for the original team (+/- 2 women, +/- 10 men). Also, several team members were added between 1999 and 2009. How and when they were officially added is unclear during much of this period.

## Women on the Cassini science team



## Additions to teams

This plot shows the makeups of several teams that had additions via participating scientist and/or guest investigator programs. The blue bar indicates the number of women selected while the red bar indicates the number of men. The number at the top of each bar indicates the percentage of women.

## Conclusions

- PS (and GI) programs selected a higher percentage of women than original teams
- A single PS call cannot substantially change the percentage of women on a team
- **Note: Very few scientists of color involved in spacecraft science teams, need more data.**
- Percentage of women on most teams remains substantially below the percentage in the field
- Only Curiosity and Cassini, with multiple rounds of PS selections, substantially increased the percentage of women on their teams