

# Compute This

## NSCD Invitational 2010

### Background Information

Extrasolar planets, or “exoplanets,” are planets orbiting stars other than our sun. The first few exoplanets were discovered in the early 1990s. Since then, developments in technology and planet-hunting techniques have allowed scientists to expand our knowledge of these exotic worlds. To date, over 400 exoplanets have been found.

### Graphical Problem:

Using the data from **NASA’s PlanetQuest New Worlds Atlas**, create an X-Y scatter plot in Excel showing the total number of exoplanets discovered each year, from 1990 through 2009. Label both axes and include a title for your chart. Decide which type of trendline best fits the data, and add that trendline through your data points. Include your team name and number at the top of the Excel chart.

### Short Answer Questions:

In Microsoft Word, provide the answer and associated URL for each of the following questions. Only official NASA.gov web sites may be referenced. Complete sentences are NOT required. Include your team name and number at the top of the Word document.

1. Based on your graph’s trendline, how many exoplanets might you expect to be discovered in 2012? (no URL required)
2. How small is the smallest exoplanet found to date?
3. What is significant about planet HD 189733 b?
4. a. What is the catalog name of the first planet found in the habitable zone?  
b. When was this planet discovered?
5. Briefly describe the method the Kepler Space Telescope uses to find exoplanets.
6. What is a biomarker?
7. The Terrestrial Planet Finder will use a technique called “interferometry” to study exoplanets. What does an interferometer do?

### Submitting Your Files:

Save your Word document and your Excel chart on the desktop with **YOUR TEAM NAME AS THE FILENAME**. (i.e. yourschoolJV.doc and yourschoolJV.xls)

**Compute This  
NSCD Invitational 2010  
Score Sheet and Answer Key**

**Team Name:** \_\_\_\_\_ # \_\_\_\_\_

**Excel Chart:**

**Team Name and Number at Top:** ..... / 2

**Title Above Graph:** ..... / 3

**Axes Labeled:** ..... / 5

**Complete and Accurate Data Points:** ..... / 20

**Trendline (nonlinear):** ..... / 10

**Format (XY Scatter) and Quality of Graphical Presentation** ..... / 10

**Short Answers:**

**1. Between 75 and 85 (based on quadratic trendline)** ..... / 6

**2. 1.9 Earth Masses** ..... / 4

**3. First water vapor detected (also organic molecules)** ..... / 4

**4. a) HD28185 b) 2001** ..... / 6

**5. Transit Method – looks for periodic dimming from mini eclipses.....** / 6

**6. A molecule which indicates the presence of life** ..... / 6

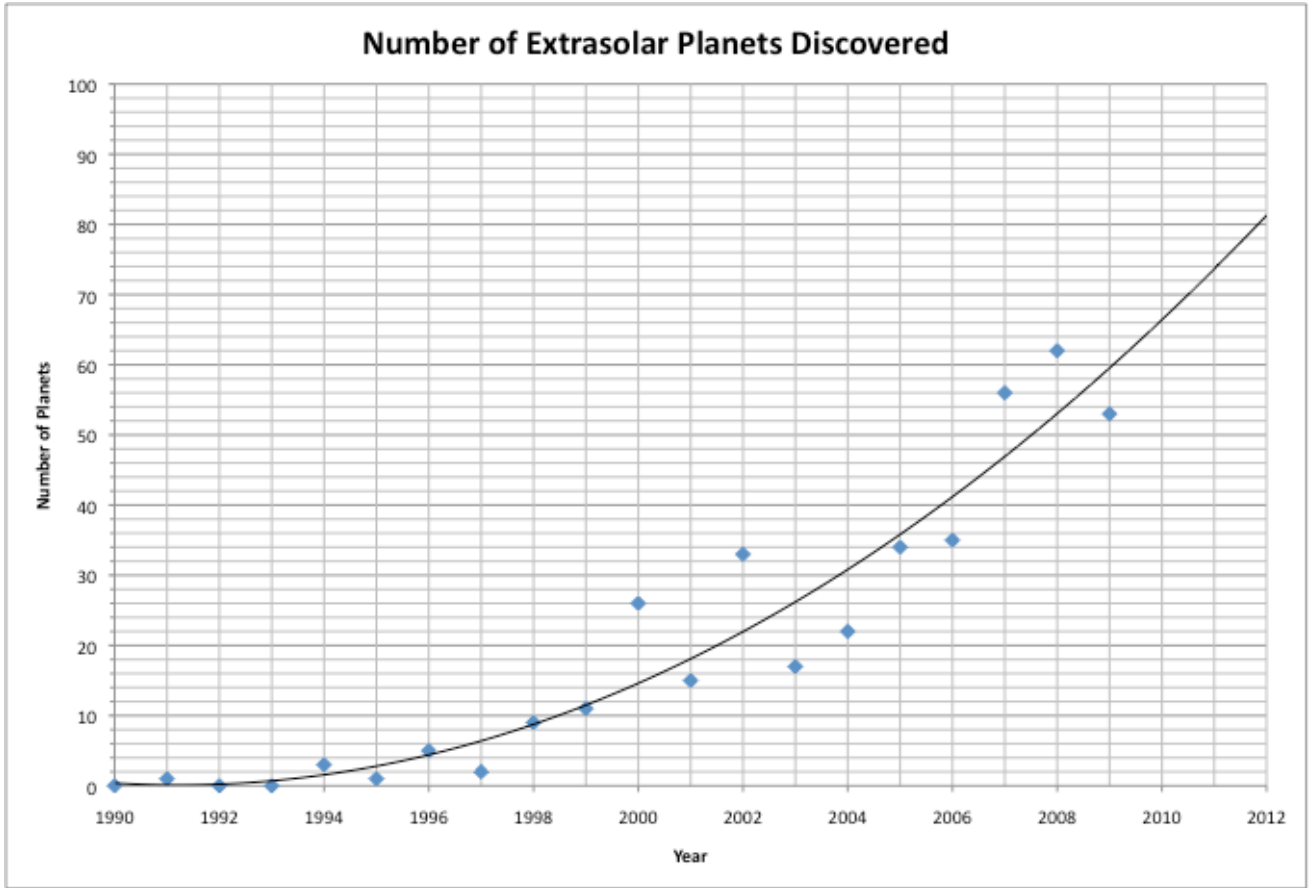
**7. Combines waves from multiple telescopes to cancel out light** ..... / 6

**URLs for Questions 2-7, each containing “/nasa.gov/”** ..... / 12

<b>TOTAL SCORE:</b> ..... / 100
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**Tiebreakers:**

- 1. The number of short answer questions correctly answered**
- 2. The completeness and accuracy of quantitative data collected**
- 3. The overall quality of graphical data presentation**



1990	0
1991	1
1992	0
1993	0
1994	3
1995	1
1996	5
1997	2
1998	9
1999	11
2000	26
2001	15
2002	33
2003	17
2004	22
2005	34
2006	35
2007	56
2008	62
2009	53