Hi Everyone,

I've been looking at HD 80606 (the extremely high-e planet originally reported by the Swiss). About a month ago, Debra sent the 23 Keck velocities for the star (current through 245304.891). 55 Swiss velocities (with larger errors) have been published, so I have done some fits to the combined system, taking Keck-Elodie offset as a free parameter.

My best 1-planet fit to the combined system is pretty bizarre:

sqrt(chi^2)=1.62

P = 111.301003 d
Mean anomaly = 296.718994 deg at epoch JD 2451508.677
(equivalent to Tperi= JD 2451528.2416)
e = 0.9712 (!)
w = 309.946014
M=4.83 Mjup

telescope offset = -85.82 m/s

The higher eccentricity is resulting from the following Keck point:
52307.873 682.42 4.85 & keck \\

As you can see from the attached RV plot, Keck caught the planet closer to perihelion than did the Swiss, showing that the radial velocity swing is greater than previously measured, which forced the eccentricity to a higher value. If this is confirmed, it would be a truly remarkable result.

For the fit above, I compute a transit probability of 5%, assuming a 1 Rsun parent star. The transit is predicted for: JD 2453087.33 (March 22, 2004), and would last for about 9 hours. Would it be ok to alert Greg Henry to this possibility? In the second attached figure, I plot the best-fit orbit of the planet, with periastron and transit marked. The black dots on the orbital curve are spaced at 1-day intervals. There is a lot of action around periastron, which occurs a day before the possible transit.

I looked at the Keck Schedule, and it doesn't seem that you guys have time during the March 20-22 period when the RV swing occurs. The star is already starting to move quickly, however, so RV shots taken during the next week are of much more value than through the bulk of the 111 day cycle when the planet is hanging out at apoastron.

I also have a radical 2-planet fit with chi^2=1.62 which brings the eccentricity down to a more manageable level. But more good-quality velocities are needed.

best,
Greg