

Title: The Search for Rocky Planets

Butler continues his survey of the nearest 2,000 sun-like stars within 50 pc. These surveys have uncovered about half of the 300 known exoplanets. Ongoing improvements in precision have taken this program from Jovian mass planets to Neptune mass, and are now beginning to probe the terrestrial mass regime. These surveys use the Keck 10-m (in conjunction with Steve Vogt and Greg Laughlin at UCSC), the 3.9-m Anglo-Australian Telescope (with Chris Tinney and Hugh Jones), and the 6.5-m Magellan telescope (with Dante Minniti and Steve Shectman). Over the next year this program will incorporate three major hardware upgrades. The MIKE spectrometer on Magellan will be replaced with a custom Planet Hunting Spectrometer that is being built by Jeff Crane and Steve Shectman) at the Carnegie Observatories optical shop in Pasadena. In conjunction with Greg Henry at Tennessee State University, two 0.8-m robotic telescopes will be installed at Las Campanas Observatory to photometrically survey the southern hemisphere planet search stars. Steve Vogt is leading the effort to install a 2.4-m dedicated precision velocity telescope at Lick Observatory in California.

List of Papers:

2008 ``A Jupiterlike Planet Orbiting the Nearby M Dwarf GJ 832'', *{\it The Astrophysical Journal}*, submitted.
J.Bailey, R.P.Butler, C.G.Tinney, H.R.A.Jones, S.OToole,
B.D.Carter

2008 ``Low Mass Companions for Five Solar-Type Stars from the Magellan Planet Search Program'',
{\it The Astrophysical Journal}, submitted.
D.Minniti, R.P.Butler, M.Lopez-Morales, S.A.Shestman,
F.C.Adams, P.Arriagada, A.P.Boss, J.E.Chambers

2008 ``Two Jupiter Mass Planets Orbiting HD 154672 and HD 205739'', *{\it The Astronomical Journal}*, submitted.
M.Lopez-Morales, R.P.Butler, D.A.Fischer, D.Minniti,
S.A.Shestman, G.Takeda, F.C.Adams, P.Arriagada

2008 ``The Keck Planet Search: Detectability and the Minimum Mass and Orbital Period Distribution of Extrasolar Planets'', *{\it Publications of the Astronomical Society of the Pacific}*, accepted.
A.Cumming, R.P.Butler, G.W.Marcy, S.S.Vogt, J.T.Wright,
D.A.Fischer

2008 ``Measurement of the Spin-Orbit Angle of the

Exoplanet HAT-P-1b", {it The Astrophysical Journal}, accepted.
J.A.Johnson, J.N.Winn, N.Narita, K.Enya, P.K.G.Williams, G.W.Marcy,
B.Sato, Y.Ohta, A.Taruya, Y.Suto, E.L.Turner, D.A.Fischer, G.Bakos,
R.P.Butler, S.S.Vogt, W.Aoki, M.Tamura, T.Yamada, Y.Yoshii

2008 ``The Prograde Orbit of Exoplanet TrES-2",
{it The Astrophysical Journal}, accepted.
J.N.Winn, J.A.Johnson, N.Narita, Y.Suto, E.L.Turner,
G.W.Marcy, D.A.Fischer, R.P.Butler, S.S.Vogt, F.T.O'Donovan,
D.Charbonneau, B.S.Gaudi

2008 ``The Amplitude of Solar Oscillations
Using Stellar Techniques",
{it The Astrophysical Journal}, accepted.
H.Kjeldsen, T.R.Bedding, T.Arentoft, R.P.Butler,
T.Dall, C.Karoff, L.L.Kiss, C.G.Tinney, W.J.Chaplin

2008 ``HAT-P-7b: An Extremely Hot Massive Planet
Transiting a Bright Star in the Kepler Field",
{it The Astrophysical Journal}, accepted.
A.Pal, G.A.Bakos, G.Torres, R.W.Noyes, D.W.Latham,
G.Kovacs, G.W.Marcy, D.A.Fischer, R.P.Butler,
D.D.Sasselov, B.Sipocz, G.A.Esquerdo, G.Kovacs,
R.P.Stefanik, J.Lazar, I.Papp, P.Sari

2008 ``The Jupiter Twin HD 154345b",
{it The Astrophysical Journal Letters}, accepted.
J.T.Wright, G.W.Marcy, R.P.Butler, S.S.Vogt

2008 ``HAT-P-6b: A Hot Jupiter Transiting a Bright
F Star", {it The Astrophysical Journal Letters}, 673,79.
R.W.Noyes, G.A.Bakos, G.Torres, A.Pal, G.Kovacs, D.W.Latham,
J.M.Fernandez, D.A.Fischer, R.P.Butler, G.W.Marcy, B.Sipocz,
G.A.Esquerdo, G.Kovacs, D.D.Sasselov, B.Sato, R.P.Stefanik,
M.Holman, J.Lazar, I.Papp, P.Sari

2007 ``HAT-P-4b: A Metal-rich Low-Density Transiting
Hot Jupiter", {it The Astrophysical Journal Letters}, 670,41.
G.Kovacs, G.A.Bakos, G.Torres, A.Sozzetti, D.W.Latham,
R.W.Noyes, R.P.Butler, G.W.Marcy, D.A.Fischer, J.M.Fernandez,
G.A.Esquerdo, D.D.Sasselov, R.P.Stefanik, A.Pal, J.Lazar,
I.Papp, P.Sari

2007 ``HD 147506b: A Supermassive Planet in an Eccentric
Orbit Transiting a Bright Star",
{it The Astrophysical Journal}, 670,826.

G.A.Bakos, G.Kovacs, G.Torres, D.A.Fischer, D.W.Latham,
R.W.Noyes, D.D.Sasselov, T.Mazeh, A.Shporer, R.P.Butler,
R.P.Stefanik, J.M.Fernandez, A.Sozzetti, A.Pal, J.Johnson,
G.W.Marcy, J.N.Winn, B.Sipocz, J.Lazar, I.Papp, P.Sari

2007 ``HAT-P-3b: A Heavy-Element-rich Planet Transiting
a K Dwarf Star'',
{\it The Astrophysical Journal Letters}, 666, 121.
G.Torres, G.A.Bakos, G.Kovacs, D.W.Latham, J.M.Fernandez,
R.W.Noyes, G.A.Esquerdo, A.Sozzetti, D.A.Fischer,
R.P.Butler, G.W.Marcy, R.P.Stefanik, D.D.Sasselov,
J.Lazar, I.Papp, P.Sari

2007 ``A Jovian Planet Orbiting the M Dwarf GJ 317
and Measuring the Stellar-Mass-Planet Correlation'',
{\it The Astrophysical Journal}, submitted.
J.A.Johnson, R.P.Butler, G.W.Marcy, D.A.Fischer,
S.S.Vogt, J.T.Wright, K.M.G.Peek

2007 ``Spin-Orbit Alignment for the Eccentric
Exoplanet HD 147056b'',
{\it The Astrophysical Journal}, 665, 167.
J.N.Winn, J.A.Johnson, K.M.Peek, G.W.Marcy, K.Enya,
N.Narita, G.A.Bakos, R.P.Butler, Y.Sutol, E.L.Turner,
S.S.Vogt

2007 ``Solar-like Oscillations in the Metal-Poor
Subgiant \$\nu\$ Indi: II. Acoustic Spectrum and Mode Lifetime'',
{\it Astronomy \& Astrophysics}, 470, 1059.
F.Carrier, H.Kjeldsen, T.R.Bedding, B.J.Brewer, R.P.Butler,
P.Eggenberger, F.Grundahl, C.McCarthy, A.Retter, C.G.Tinney

2007 ``Fourteen New Companions from the
Keck \& Lick Radial Velocity Survey Including
Five Brown Dwarf Candidates'',
{\it The Astrophysical Journal}, 665, 744.
S.G.Patel, S.S.Vogt, G.W.Marcy, J.A.Johnson,
D.A.Fischer, J.T.Wright, R.P.Butler

2007 ``Retired A Stars and Their Companions:
Exoplanets Orbiting Three Intermediate-Mass Subgiants'',
{\it The Astrophysical Journal}, 665, 785.
J.A.Johnson, D.A.Fischer, G.W.Marcy, J.T.Wright,
P.Driscoll, R.P.Butler, S.Hekker, S.Reffert, S.S.Vogt

2007 ``Solar-like Oscillations in the G2 Subgiant

β Hydri from Dual-Site Observations",
{\it The Astrophysical Journal}, 663, 1315.
T.R.Bedding, H.Kjeldsen, T.Arentoft, F.Bouchy,
J.Brandbyge, B.J.Brewer, R.P.Butler, J.Christensen-Dalsgaard,
T.Dall, S.Frandsen, C.Karoff, L.L.Kiss, M.J.P.F.G. Monteiro,
F.P.Pijpers, T.C.Teixeira, C.G.Tinney, I.K.Baldry, F.Carrier,
S.J.O'Toole

2007 ``New Planets Around Three G Dwarfs",
{\it The Astrophysical Journal}, 660, 1636.
S.O'Toole, R.P.Butler, C.G.Tinney, H.R.A.Jones,
G.W.Marcy, B.D.Carter, C.McCarthy, J.Bailey, A.J.Penny,
K.Apps, D.A. Fischer

2007 ``Four New Exoplanets, and Hints of Additional Substellar
Companions to Exoplanet Host Stars",
{\it The Astrophysical Journal}, 657, 533.
J.T.Wright, G.W.Marcy, D.A.Fischer, R.P.Butler, S.S.Vogt,
C..G.Tinney, H.R.A.Jones, B.D.Carter, J.A.Johnson, C.McCarthy, K.Apps

List of Observing Runs:

Mar 29-30	MIKE	Chile
Apr 26-May 6	AAT	Australia
Aug 24-26	Magellan	Chile
Sep 25 - Oct 1	AAT	Australia
Oct 22-25	Keck	Hawaii
Nov 20-28	AAT	Chile
Jan 17-18	Magellan	Chile
Feb 4	Magellan	Chile
Mar 17-27	AAT	Australia
May 13-14	Keck	Hawaii
Jul 18-19	Keck	Hawaii
Jul 22-25	Keck	Hawaii
Aug 22-25	Keck	Hawaii