Scientific Program

Invited talks: 30mins+10mins questions
Contributions: 15mins+5mins questions

September 25th

1. Transit Surveys and Observing Strategies

9:00am: Welcome and Introduction by Thomas Henning & LOC

Chairman : Thomas Henning

9:10am: Detection capacities of ground-based transit surveys (the ISSI team on exoplanet transits) (Invited talk)
Frédéric Pont, Geneva Observatory, Switzerland.

9:50am: The Transatlantic Exoplanet Survey (Invited talk)
Roi Alonso, Instituto de Astrofisica de Canarias, Spain.

10:30-11:00am: Coffee Break

Chairman : Stefan Dreizler

11:00am: Current status of the extrasolar planet search with HATNet
Gaspar Bakos, Harvard Smithsonian Center for Astrophysics, USA.

11:20am: The Search for Extrasolar Planets with BEST
Petr Kabath, DLR-Berlin, Germany.

11:40am: Results from the KELT Transit Survey
Joshua Pepper, The Ohio State University, USA.

12:00pm: The MONITOR project: Searching for transiting planets and low-mass eclipsing binaries in young open clusters
Suzanne Aigrain, IOA, Cambridge, United Kingdom.

12:20-2:00pm: Lunch

Chairman : Jochen Eislöffel

2:00pm: Discussion about morning session

2:10pm: An all sky transit survey using the Solar Mass Ejection Imager, SMEI
Steven Spreckley, University of Birmingham, United Kingdom.

2:30pm: The University of New South Wales Extrasolar Planet Search
Marton Hidas, UNSW, Australia.

2:50pm: Transit Campaigns of the OGLE-III Survey (Invited talk)
Andrzej Udalski, Warsaw University, Poland.

3:30pm: TrES-2: The First Transiting Planet in the Kepler Field
Francis T. O'Donovan, California Institute of Technology, USA.

3:50-4:20pm: Coffee Break

Chairman : Klaus Strassmeier

4:20pm: A UKIRT WFCAM search for transits around M stars
Simon Hodgkin, IOA, Cambridge, United Kingdom.

4:40pm: A Search for Transiting Hot Planets as Small as Neptune in the Open Cluster M37
Joel Hartman, Harvard University, USA.

5:00pm: The Suitability of XO for Detecting Planets Around M Dwarfs
Christopher Burke, Space Telescope Science Institute, USA.

5:20pm: Optimal field selection for OmegaTranSDwarfs counts for wide-field planet searches
Mauro Barbieri, Padova University, Italy.

5:40 pm: Discussion about afternoon session

6:15 pm: Bus to Heidelberg (IBIS Hotel, next to main train station)

September 26th

2. Transit Identification: Photometry, Systematics and False Positives

Chairman : Johny Setiawan

9:00am: Photometry, aperture, PSF, DIA, trend filtering algorithms (Invited talk)
Gaspar Bakos, Harvard Smithsonian Center for Astrophysics, USA.

9:40am: High Accuracy transit photometry with a deconvolution-based algorithm
Michaël Gillon, Observatoire de Geneve, Switzerland.

10:00am: Systematic effects removal (Invited talk)
Tsevi Mazeh, University of Tel Aviv, Israel.

10:40-11:10am: Coffee Break

Chairman : Marton Hidas

11:10am: CoRoT expected performances: lessons learned from blind tests
Suzanne Aigrain in behalf of Claire Moutou, Laboratoire d'Astrohpysique de Marseille, France.

11:30am: Signal Search and Reconstruction by a Trend Filtering Algorithm
Geza Kovacs, Konkoly Observatory, Hungary.

11:50am: Transit Detection from the SuperWASP Database
Rachel Street, Queens University, Belfast, United Kingdom.

12:10pm: A Matched-filter based algorithm for transit detection Application to simulated COROT light curves
François Fressin, Observatoire de la Côte d'Azur, France on behalf of Pascal Bordé, Harvard Smithsonian Center for Astrophysics, USA.

12:30-2:00pm: Lunch

Chairman : Cristina Afonso

2:00pm: Discussion about morning session

2:10pm: The Colour of noise in SuperWASP data and the implications for finding extra-solar planets
Alexis Smith, University of St.Andrews, United Kingdom.

2:30pm: Developments in Planet Detection using Transit Timing Variations
Jason Steffen, Fermilab, USA.

2:50pm: Transit Timing Variations with the MOST Satellite
Eliza Miller-Ricci, Harvard Smithsonian Center for Astrophysics, USA.

3:10-5:00pm: Coffee Break & POSTER SESSION

Chairman : Tim Lister

5:00pm: Exoplanets and the Rossiter-McLaughlin Effect
Josh Winn, Massachusetts Institute of Technology, USA.

5:20pm: Using the Rossiter Effect to Detect Transiting Terrestrial Planets
William Welsh, San Diego State University, USA.

5:40pm: Discussion about afternoon session

6:15 pm: Bus to Heidelberg (IBIS Hotel, next to main train station)

September 27th

3. Characterisation: Follow-up Observations and Determination of Planetary System Parameters

Chairman : Martin Kürster

9:00am: Radial Velocity follow-up for confirmation and characterisation of transiting exoplanets (Invited Talk)
Didier Queloz in behalf of François Bouchy, Institut d'Astrophysique de Paris, France.

9:40am: Follow-up Observations of Transiting Planet Candidates
David Latham, Harvard Smithsonian Center for Astrophysics, USA.

10:00am: Follow up on OGLE targets
Didier Queloz, Obervatoire de Geneve, Switzerland.

10:20-10:50am: Coffee Break

Chairman : Brandon Tingley

10:50am: Follow-up Photometry of Planetary Systems (Invited Talk)
Frédéric Pont in behalf of Claire Moutou, Laboratoire d'Astrophysique de Marseille, France.

11:30am: The Kepler Follow-up Observation Program
Thomas Gautier, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, USA.

11:50am: Rejecting Astrophysical False Positives from the TrES Transit Survey
Francis O'Donovan, California Institute of Technology, USA.

12:10pm: The Transit Light Curve (TLC) Project
Matthew Holman, Harvard Smithsonian Center for Astrophysics, USA.

12:30-2:00pm: Lunch

Chairman : Stephen Kane

2:00pm: Discussion about morning session

2:10pm: Simultaneous Subaru/MAGNUM Observations of Extrasolar Planetary Transits
Norio Narita, University of Tokyo, Japan.

2:30pm: The X-ray irradiation and evaporation of close-in planets
Peter Wheatley, University of Warwick, United Kingdom.

2:50pm: High Precision secondary eclipse measurements in the near-infrared
Ignas Snellen, Leiden Observatory, Netherlands.

3:10pm: XO Planet(s)
Peter McCullough, Space Telescope Science Institute, USA.

3:30-4:00pm: Coffee Break

Chairman : Edward Dunham

4:00pm: The Spitzer Transiting Planet Target of Opportunity Program
Joseph Harrington, University of Central Florida, USA.

4:20pm: New approaches to detect satellite of exo-planets by transit
Juan Cabrera, Observatoire de Paris-Meudon, France.

4:40pm: Asteroseismology: A unique tool for planet transits
Dennis Stello, University of Sydney, Australia.

5:00pm: Discussion about afternoon session

5:30pm: Bus to Heidelberg (IBIS Hotel, next to main train station)

8:00pm: Dinner in Heidelberg at the Kulturbrauerei

September 28th

4. Simulations and Planet Statistics

Chairman : Arnaud Cassan

9:00am: Statistics and Simulations of Transit Surveys (Invited Talk)
Scott Gaudi, Harvard Smithsonian Center for Astrophysics, USA.

9:40am: On the potential of extrasolar planet transit surveys
Michaël Gillon, Observatoire de Geneve, Switzerland.

10:00am: Searching for Transits in Globular Clusters
David Weldrake, Max-Planck Institut für Astronomie, Germany.

10:20-10:50am: Coffee Break

5. Planetary Atmospheres and Impact of Transits on Theoretical Predictions of Planet Formation and Composition

Chairman : Hubert Klahr

10:50am: Monte Carlo Models of Giant Planet Formation (Invited Talk)
Willy Benz, University of Bern, Switzerland.

11:30am: Constraints on the Compositions of Transiting Planets (Invited Talk)
Tristan Guillot, Observatoire de la Côte d'Azur, France.

12:10pm: Hot Jupiter Model Atmospheres and Infrared Spectra
Jonathan Fortney, NASA Ames Research Center, USA.

12:30-2:00pm: Lunch

2:00pm: Discussion about morning session

6. Future Surveys

Chairman : David Weldrake

2:10pm: Kepler Mission Status
William Borucki, NASA Ames Research Center, USA.

2:40pm: Hot Exoplanet Transit Experiment (HETE) Sky Survey: Present and Future Space-based All Sky Surveys
George Ricker, Massachusetts Institute for Technology, USA.

3:00pm: 50,000 Transiting Planets from the Microlensing Planet Finder
David Bennett, University of Notre Dame, USA.

3:20-4:00pm: Coffee Break

Chairman : Sara Heap

4:00pm: A STEP: an Antarctic Search for Transiting Extrasolar Planets
François Fressin, Observatoire de la Côte d'Azur, France.

4:20pm: SkyMapper search for Transiting Hot Jupiters
Daniel Bayliss, Mount Stromlo Observatory, Australia.

4:40pm: PAN-PLANETS: a Massive Search for Hot Jupiters
Cristina Afonso, Max-Planck für Astronomie, Germany.

5:00pm: Summary Overview and Discussion
Penny Sackett, Mount Stromlo Observatory, Australia.

6:15pm: Bus to Heidelberg (IBIS Hotel, next to main train station)

Detection Capacities of Ground-based Transit Surveys (the ISSI team on exoplanet transits)

Frédéric Pont, Geneva Observatory, Switzerland

Numerous ground-based photometric surveys are now under way, and they have led to the detection of several transiting exoplanets. Nevertheless, up to now these surveys have yielded results that are much lower the initial expectation. They faced the difficult task of pioneering a new field, and learnt that the overwhelming number of false positives and confusion scenarios, combined with the insufficient phase coverage and systematic residuals in the photometry, could make ground-based surveys rather inefficient in the detection of transiting planets. Thanks to these "first generation surveys", a much finer understanding of the issues involved is starting to emerge, including the definition of the actual detection threshold in the presence of real photometric noise, and the full pamorama of planetary transit mimics and false positives. This new understanding can lead to improvements in the observing strategies and analysis schemes for a new generation of surveys, and can be useful for the coming Corot and Kepler space-based transit search missions.

Rejecting Astrophysical False Positives from the TrES Transit Survey

Roi Alonso, Instituto de Astrofisica de Canarias, Spain
and
T. Brown, D. Charbonneau, T. Dunham, J.A. Belmonte, H. Deeg, J.M. Fernndez, D. Latham, G.Mandushev, F.T. O'Donovan, M. Rabus, R. Stefanik, G.Torres

Transiting exoplanets around bright stars provide an opportunity to perform several follow-up measurements, such as detections of the secondary eclipses or of the planet's atmosphere through transmission spectroscopy. But there are few known transiting planets around bright stars. Aiming to increase this number, three wide-field telescopes, with a $\sim$ 6x6 deg^2 FOV each, have been monitoring relatively bright stars for more than three years as a network. As an example of an active wide-field search, I describe the different instrumentation and techniques used by the team, and I summarize the achievements and main difficulties of such an effort. These lead to the discovery of the transiting planet TrES-1, but also to unveil the true nature of several hard-to-identify false positives, such as GSC 01944-02289 and GSC 03885-00829.

Current status of the extrasolar planet search with HATNet

Gaspar Bakos, Harvard Smithsonian Center for Astrophysics, USA

Current status of the extrasolar planet search with HATNet Abstract: HATNet is a network of small, wide-angle "HAT" telescopes maintained by the Center for Astrophysics. The instruments are located at two sites: the Fred Lawrence Whipple Observatory (FLWO), Arizona (HAT-5, HAT-6, HAT-7, HAT-10) and at the Submillemeter Array facility atop Mauna Kea (HAT-8 and HAT-9). HATNet has been operational since 2003, gathered close to half million science frames. The precision for the brightest stars at I=8 reaches 3mmag rms. The longitude separation, uncorrelated weather, and identical instrumentation help extending our phase coverage. HATNet produced some one hundred transit candidates, and most of these have been actively followed up by spectroscopy. I will review the current status and operation of HATNet, along with the follow-up scheme.

The search for extrasolar planets with BEST

Petr Kabath, DLR-Berlin, Germany
and
the BEST Team

The Berlin Exoplanet Search Telescope (BEST) is a small-sized wide-field Telescope dedicated to photometric search of extrasolar planetary transit events and stellar variability in selected fields. Since summer 2004 BEST has been operating from Observatoire de Haute Provence, France. The telescope has a $3^\circ \times 3^\circ$ field of view and it is equipped with 2k CCD camera. The photometric precision of the light curves is better than 1% down to 14^{th} magnitude stars. At Haute Provence BEST operates as a ground based support of the COROT space mission. Currently a second similar system (BEST II) is under commissioning to be placed in the Atacama desert, Chile. The status of both BEST systems and the scientific yield from observations at OHP will be presented and discussed.

Results From the KELT Transit Survey

Joshua Pepper, Ohio State University, USA

The Kilodegree Extremely Little Telescope (KELT) survey is a wide-field, small-aperture transit survey of bright stars. The project has completed commissioning runs searching for transits in the Hyades and Praesepe, and is well into a multi-year survey of a large portion of the Northern Hemisphere. I will present initial results of our search for transits.

The Monitor project: searching for transiting planets and low-mass eclipsing binaries in young open clusters

Suzanne Aigrain, Institute of Astronomy, University of Cambridge, UK
and
Jonathan Irwin, Institute of Astronomy, University of Cambridge, UK

We have begun a large-scale program of time-resolved wide-field photometry on young open clusters, to search for low-mass eclipsing binary (EB) and transiting planet systems (the Monitor project). Our targets are selected to have ages $<$ 250 Myr, down to the ONC (1Myr), which is our youngest target. Our goals are to (1) detect the first planets orbiting young stars, and measure their periods, masses and radii to place constraints on planet formation and evolution scenarios, (2) to make empirical mass determinations for very low-mass pre main sequence (PMS) stars and brown dwarfs, and (3) to collect a large sample of photometric rotation periods for PMS open cluster stars. We report on the current status of the survey, including several promising candidates, for which we have obtained, or are in the process of obtaining, radial velocity observations at the km/s level.

An all sky transit survey using the Solar Mass Ejection Imager (SMEI)

Steven Alan Spreckley, University of Birmingham, United Kingdom

The Solar Mass Ejection Imager is an instrument onboard the USAF Coriolis spacecraft, that is in a 100 minute sun-synchronous polar orbit. It consists of three cameras, each having a field of view of 3 degrees by 60 degrees that sweep over almost the entirety of the sky each orbit. We are using two of the cameras to search for transiting planets around the very bright stars, with I magnitudes of less than around 8 . I will present the current results from the project and a discussion of the unique nature of the data set and the pipeline that has been developed for handling the data.

The University of New South Wales Extrasolar Planet Search

Marton Hidas, University of New South Wales, Australia

Our team at the University of New South Wales (UNSW) is searching for transiting extrasolar planets using the 0.5 m Automated Patrol Telescope (APT) at Siding Spring Observatory, Australia. We monitor pairs of fields (2×3 degrees each) at intermediate galactic latitudes (15 deg $\leq |b| \leq$ 45 deg), over runs of approximately two months. To date we have identified about 50 planet candidates, though follow-up studies have shown these to be eclipsing binary stars. A new CCD camera for the APT – currently under construction – will provide higher sensitivity, better image sampling, and up to an 8-fold increase in field of view, increasing our search efficiency accordingly.

Transit Campaigns of the OGLE-III Survey

Andrzej Udalski, Warsaw University Observatory, Poland

Details and results of the planetary transit campaigns conducted by the OGLE-III Survey in 2001-2006 will be presented.

TrES-2: The First Transiting Planet in the Kepler Field

Francis T. O'Donovan, California Institute of Technology, USA

The planet TrES-2 is the second transiting hot Jupiter discovered by the Trans-atlantic Exoplanet Survey. TrES-2, which orbits the nearby star GSC 03549-02811 every 2.47063 days, is the most massive of the nearby transiting planets. This planet lies within the field of view of the NASA Kepler mission, ensuring that hundreds of upcoming transits will be monitored with exquisite precision and permitting a host of unprecedented investigations. The large impact parameter (b=0.84, the largest of known transiting exoplanets) for this system facilitates observations of the Rossiter-McLaughlin effect and planetary flux variations. We present here current and future plans for follow-up observations of TrES-2.

A UKIRT WFCAM search for transits around M stars

Simon Thomas Hodgkin, Institute of Astronomy, Cambridge, United Kingdom

We are using the UKIRT Wide Field Camera to monitor thousands of M stars to search for close planetary and substellar companions via the transit method. We are sensitive to planets with masses as low as 2 Earth Masses, with separations which overlap the habitable zone for M dwarfs (0.02-0.4 AU). We will present preliminary results from initial observations. We will report on our observing strategy (based around a queue scheduled telescope) and the noise properties of the data. We will discuss the implications for near-infrared transit surveys with wide-field instruments on 4m class telescopes.

A Search for Transiting Hot Planets as Small as Neptune in the Open Cluster M37

Joel Hartman, Harvard University, USA
and
Scott Gaudi

We are conducting a transit survey of the open cluster M37 using the Megacam instrument on the 6.5 m Multiple-Mirror Telescope. We have obtained $\sim$ 4500 images of this cluster over 18.5 nights and have achieved the precision necessary to detect planets as small as Neptune. In this presentation I will provide an overview of the project, describe the ongoing data reduction/analysis and present some of our preliminary results.

The Suitability of XO for Detecting Planets Around M Dwarfs

Christopher Burke, Space Telescope Science Institute, Baltimore, USA

The XO transit survey currently covers 10% of the sky. I discuss the suitability of XO for detection of low mass planets around M dwarfs.

Dwarfs counts for wide-field planet searches

Mauro Barbieri, University of Padova, Italy

A significative statistic of planetary transits could be reached only with the observation of a large number Lower Main Sequences Stars (LMSS): specifically F, G and K stars. Optimal stellar fields for a wide-field planet search should contain the largest number of these stars. Here we present a new method for the identification of LMSS from public stellar catalogs and the application of this method for the selection of the fields of the OmegaTranS project. The main results of this work are: 1) the anticorrelation of high star counts and high counts of LMSS, that was used by many transit surveys as a criterion for fields selection, 2) the correlation between LMSS counts and the dust scale height on the galactic plane, 3) the natural evidence that the principal contaminants in the counts of LMSS are early dwarfs instead giants.

Data reduction for transit surveys with different photometric algorithms: Aperture, PSF, and DIA

Gaspar Bakos, Harvard Smithsonian Center for Astrophysics, USA

I will review the concurrent photometric algorithms from the viewpoint of transit detection: the goal is to maximize the signal-to-noise ratio of an almost box-shaped transit signal in the light-curve of stars that are derived by differential photometry. The demand to achieve milli-magnitude photometry in potentially very wide, distorted fields that are crowded with under-sampled stars initiated development of new algorithms, as well as revisiting the existing ones. I will attempt to give an overview based on both simulated and real data. I will also briefly cover post-processing methods, such as the Trend-Filtering Algorithm (TFA).

High accuracy transit photometry with a deconvolution-based algorithm

Michaël Gillon, Geneva Observatory, Switzerland
and
Pierre Magain, Frédéric Courbin, Sandrine Sohy, Frédéric Pont, Claire Moutou

A high accuracy photometric reduction algorithm is needed to take full advantage of the potential of the transit method for the characterization of extrasolar planets, especially in deep crowded fields. It has to reduce to the lowest possible level the negative influence of systematic effects on the photometric accuracy. It should also be able to cope with a high level of crowding and with large scale variations of the spatial resolution from one image to another. A recent deconvolution-based photometry algorithm fulfills all these requirements, and also increases the resolution of astronomical images, which is an important advantage for the detection of blends and the discrimination of false positives in transit photometry. We made changes to this algorithm in order to adapt it to transit photometry and used it to reduce NTT and VLT observations of some OGLE planets' transits. We obtained very high accuracy transit light curves with a low level of systematic residuals. We used them, with former photometric and spectroscopic measurements, to derive new stellar and planetary parameters. Our results validate the high potential of our new reduction method.

Systematic Effects Removal

Tsevi Mazeh, Wise Observatory, Tel Aviv University, Israel
and
O. Tamuz and D. Zucker

We present SysRem (Tamuz, Mazeh and Zucker 2005), an algorithm to remove systematic effects in a large set of lightcurves obtained by a photometric survey. The algorithm can remove any systematic effects, like the ones associated with atmospheric extinction, detector efficiency, or PSF changes over the detector. SysRem works without any prior knowledge of the effect, as long as it linearly appears in many stars of the sample.

The algorithm, which was originally developed to remove atmospheric extinction effects, is based on a lower rank approximation of matrices. It is especially useful in cases where the uncertainties of th e measurements are unequal. For equal uncertainties SysRem reduces to the Principal Components Analysis (PCA) algorithm.

SysRem can be effective in the search for transits, where the signal is small and systematics of the data can contribute substantially to the noise. We present the results of application of SysRem to real data and discuss its advantages and limitations.

A free code of SysRem is offered to the community.

CoRoT expected performances: lessons learned from blind tests

Claire Moutou, Laboratoire d'Astrohpysique de Marseille, France
and
M. Ollivier, F. Pont, P. Barge and the CoRoT/Exoplanet team

The space based mission CoRoT will be launched in October this year. A series of blind tests were performed by the CoRoT team in order to determine the detection and characterisation performance in presence of realistic noise sources. This poster describes the results and presents the lessons learned from this exercise.

Signal Search and Reconstruction by a Trend Filtering Algorithm

Geza Kovacs, Konkoly Observatory, Hungary
and
Gaspar Bakos

In an effort of separating the true signal from pure noise and systematics due to data reduction and instrumental imperfections, Kovacs, Bakos & Noyes (2005, MNRAS, 356, 557) introduced a Trend Filtering Algorithm (TFA) for the analysis of photometric time series. Important aspects of TFA are as follows: (i) it is a least squares (LS) method; (ii) it uses randomly selected time series sampled in the same way as the target time series; (iii) in searching for signal periodicity, the LS minimization leads to signals of minimum variance with a concomitant decrease of the amplitude of the true signal; (iv) in an application to signal reconstruction, the dispersion of residuals between the true and observed signals are minimized in an iterative procedure. Here we present additional tests on the effect of template selection concerning periodic transit detection and false alarm rates. We also comment on the extension of the method for analyzing multi-periodic signals, including mixtures of sinusoidal and transit components.

Transit Detection from the SuperWASP Database

Rachel Street, Queen's University, Belfast, United Kingdom
and
A.C. Cameron, D. Christian, W. Clarkson, R. Enoch, S.R. Kane, T.A. Lister, R. Street, R. West, D. Wilson, A. Evans, C.A. Haswell, C. Hellier, K. Horne, J. Irwin, A.J. Norton, D. Pollacco, I. Skillen, P.J. Wheatley

During 2004, SuperWASP-North (La Palma) observed 6.7 million stars between V 8-15 mag for up to 5 months. Our automated reduction pipeline has generated a database of some 1.4TB of long timebase photometric data from this season/instrument alone. In this paper, we present the algorithm used to mine our large-scale database held at the University of Leicester for exoplanetary transits, and discuss the criteria used to filter the resulting candidate list for data artefacts and astrophysical false positives. We give examples of some of the candidates found to date and examine their properties, while additionally discussing some of the potential pitfalls in large-scale automated transit searches of this kind.

A matched-filter based algorithm for transit detection - Application to simulated COROT light curves

Pascal Jacques Paul Bordé, Harvard-Smithsonian Center for Astrophysics, USA
and
François Fressin, Marc Ollivier, Alain Léger, and Daniel Rouan

We will present a matched-filter based algorithm for transit detection and its application to simulated COROT light curves. This algorithm stems from the work by Borde, Rouan and Leger (2003, A& A, 405, 1137). We will describe the different steps we intend to take to discriminate between planets and stellar companions using the three photometric bands provided by COROT. These steps include the use of Tingley & Sackett's diagnostic (Tingley & Sackett 2005, ApJ, 627, 1011), the search for secondary transits, the search for ellipsoidal variability (e.g. Sirko & Paczynski 2003, ApJ, 592, 1217), and the study of transit chromaticity. Finally, we will discuss the performance of this approach in the context of blind tests organized inside COROT's exoplanet consortium.

The colour of noise in SuperWASP data and the implications for finding extra-solar planets

Alexis Smith, University of St. Andrews, United Kingdom

A recent study demonstrated that there is significant covariance structure in the noise on data from ground-based photometric surveys designed to detect transiting extrasolar planets. Such correlation in the noise has often been overlooked, especially when predicting the number of planets a particular survey is likely to find. Indeed, the shortfall in the number of transiting extrasolar planets discovered by such surveys seems to be explained by co-variance in the noise. We analyse SuperWASP (Wide Angle Search for Planets) data and determine that there is a significant amount of correlated systematic noise present. After modelling the potential planet catch, we conclude that this noise places a significant limit on the number of planets that SuperWASP is likely to detect; and that the best way to boost the signal-to-noise ratio and limit the impact of co-variant noise is to increase the number of observed transits for each candidate transiting planet.

Developments in Planet Detection using Transit Timing Variations

Jason Steffen, Fermi National Accelerator Laboratory, Seattle, USA

In a transiting planetary system, the presence of a second planet will cause the time interval between transits to vary. These transit timing variations (TTV) are particularly large near mean-motion resonances and can be used to infer the orbital elements of planets with masses that are too small to detect by any other means. I present the results of a study of simulated data where I show the potential that this planet detection technique has to detect and characterize secondary planets in transiting systems. These results have important ramifications for planetary transit searches since each transiting system presents an opportunity for additional discoveries through a TTV analysis. I present such an analysis for 13 transits of the HD209458 system that were observed with the Hubble Space Telescope. This analysis indicates that a putative companion in a low-order, mean-motion resonance can be no larger than the mass of the Earth and constitues, to date, the most sensitive probe for extrasolar planets that orbit main sequence stars. The presence or absence of small planets in low-order, mean-motion resonances has implications for theories of the formation and evolution of planetary systems. Since TTV is most sensitive in these regimes, it should prove a valuable tool not only for the detection of additional planets in transiting systems, but also as a way to determine the dominant mechanisms of planet formation and the evolution of planetary systems.

Transit Timing Variations with the MOST Satellite

Eliza Miller-Ricci, Harvard Smithsonian Center for Astrophysics, Cambridge, USA

We report on the measurement of transit times for transiting planetary systems observed with the MOST space telescope. Deviations from a constant orbital period can indicate the presence of additional planets in these systems that are yet undetected, potentially with masses approaching Earth mass. The ability of MOST to observe a single star uninterrupted for more than a month at a time allows for unprecedented time coverage of transiting planetary systems. From observations of a series of consecutive transits, strong limits can be placed on the presence of additional planets in these systems, in some cases down to smaller than an Earth mass.

Exoplanets and the Rossiter-McLaughlin Effect

Josh Winn, Massachusetts Institute of Technology, Cambridge, USA

During a planetary transit, part of the rotating stellar surface is occulted, thereby diminshing a particular velocity component in the stellar spectral lines and causing an anomalous Doppler shift. Applications of this "Rossiter-McLaughlin Effect" for the detection, confirmation, and characterization of exoplanets will be reviewed. In particular, the angle on the sky between the angular momenta of the stellar spin and planetary orbit can be measured. This may help to discriminate among migration theories, as some predict close alignment, while others involve spin-orbit randomization. Measurements have been done for two exoplanets, with two others forthcoming and hopefully done by the time of the meeting. Prospects for future observations, including signal-to-noise calculations for the effects of terrestrial planets, and secondary effects such as differential rotation, will be discussed.

Using the Rossiter Effect to Detect Transiting Terrestrial Planets

William Welsh, San Diego State University, USA

The Rossiter Effect, an observed spectroscopic radial velocity "anomaly" that occurs during transit, is a very sensitive probe of extrasolar planet dynamics. The effect depends on the projected rotation velocity of the star, the ratio of planet-to-star radii, the orbital inclination, the limb darkening, the stellar spin/orbit alignment, and the eccentricity of the orbit. We explore how the Rossiter effect can constrain these parameters and also show that the effect can be used to detect terrestrial-size extrasolar planets in 1 AU orbits. As such, this is one of the few methods that can detect "cold Earth" type exoplanets.

Radial Velocity follow-up for confirmation and characterisation of transiting exoplanets.

François Bouchy, Institut d'Astrophysique de Paris, France

Radial Velocity (RV) follow-up is essential to confirm or exclude the planetary nature of a transiting companion as well as to determine its true mass. Strategies and methodology to optimize RV follow-up and to properly rule out the different cases that can mimic photometric planetary transit are presented. Several RV facilities involved in the follow-up of ground-based and space-based photometric surveys are presented and their performances and limitations are discussed.

Follow-up on OGLE Targets

Didier Queloz et al., Geneva Observatory, Switzerland

I would like to report on the status of our large follow-up programs on OGLE targets. An international team of 18 researchers is conducting a large follow-up program on OGLE targets including spectroscopic and photometric measurements. The goal of this program is to uncover new planets from the OGLE results and to improve the M-R relations from planets to low mass M stars. New results as well as considerations on the efficiency of follow-up according to instruments and strategies shall be presented. Considerations on future programs in view of the COROT mission shall be discussed at the end.

Follow-Up Observations of Transiting Planet Candidates

David Latham, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA

We report on our efforts to follow up transiting planet candidates identified by the Vulcan, TrES, and HAT wide-angle photometric surveys. Some candidates with shallow dips in their light curves can be eliminated from further consideration because their 2MASS colors are too hot and the parent star must have too large a radius. Others can be eliminated because they show variations in the light curve outside of transit, or the dip has a duration and/or shape that is inconsistent with a planet. If a candidate passes these hurdles, our next step is a spectroscopic reconnaissance with high resolution and modest signal to noise ratio. These observations provide radial velocities to check for orbital motion due to a stellar companion and also provide a classification of the astrophysical characteristics of the primary. If the target is a giant, we assume that it is the bright component in a triple system with a pair of eclipsing main sequence stars. If the star is unevolved and no velocity variation is detected at the level of 0.5 km/s, the next step is to obtain high-quality light curves, to see if the ingress and egress are short enough to be explained by a planet, and to make sure that a nearby eclipsing system has not contaminated the low-resolution images from the wide-angle survey. Candidates that survive to this stage are then targets for very precise velocity observations to look for orbital motion due to a planetary-mass companion. So far we have used these procedures to follow up a total of 56 candidates from Vulcan, 165 from TrES, and 200 from HAT. For the initial spectroscopic reconnaissance we have obtained more than 2700 spectra using the CfA Digital Speedometers on the 1.5-m Wyeth Reflector at the Oak Ridge Observatory in Harvard, Massachusetts, and on the 1.5-m Tillinghast Reflector at the Whipple Observatory atop Mount Hopkins, Arizona. Two or three dozen of the candidates have survived this reconnaissance. One of them, TrES-1, has proven to be a planet. The others are now being pursued with further observations.

Follow-up photometry of planetary systems

Claire Moutou et al., Laboratoire d'Astrohpysique de Marseille, France

Once a planet is discovered, either by means of radial velocity or transits, it is often necessary to perform a photometric follow-up: 1) to search for a transit signature in a new RV short-period planetary system, 2) to refine the measurement of the planetary radius when the planet comes from a wide-field photometric survey, and 3) to check for possible stellar blends when the star image is potentially contaminated as in CoRoT fields. I will review recent results and present current and expected performance in such high-accuracy photometric follow-up activities.

The Kepler Follow-up Observation Program

Thomas N. Gautier, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, USA
and
William Borucki

The *Kepler* project will launch a 1 meter class Schmidt telescope into Earth trailing solar orbit to continuously monitor 100,000 dwarf stars over a period of four years to find transits of Earth-size extra-solar planets. *Kepler* is designed to be sensitive enough to detect transits of Earth sized planets around solar type stars with signal to noise ratio greater than 4. The resulting catalog of planets should contain several hundred giant planets with periods up to 1.3 years and perhaps as many as 2000 smaller, terrestrial planets with periods up to one year. This paper describes the substantial ground based observation program planned as part of the *Kepler* project to eliminate false positive identifications of transiting planets and to characterize the systems in which planets are found. Further, it describes the procedures necessary to analyze the results and to decide when to make announcements of discoveries.

Rejecting Astrophysical False Positives from the TrES Transit Survey

Francis O'Donovan, California Institute of Technology, Pasadena, USA

Driven by the incomplete understanding of the formation of sub–stellar objects and of their mass–radius relationship, several ground–based, wide–field photometric campaigns are searching the skies for new transiting extrasolar gas giants. These surveys are yielding far fewer true planets than astrophysical false positives, of which some are difficult to reject. Recent experience has highlighted the need for careful analysis to eliminate astronomical systems where light from a faint eclipsing binary is blended with that from a bright star. During the course of the Trans–atlantic Exoplanet Survey, we have identified several systems presenting a transit–like periodic signal. We present here the results of our subsequent follow–up observations as examples of the procedure followed by the TrES network to identify false positive candidates. One candidate, GSC 03885–00829, did not exhibit any signs of a stellar mass companion but was later shown to display a color–dependent transit depth, indicating that a blend was the likely source of the eclipse. We successfully modeled our initial photometric observations of GSC 03885–00829 as the light from a K dwarf binary system superimposed on the light from a late F dwarf star. This candidate in particular demonstrates the difficulty in identifying certain types of false positives in a list of candidate transiting planets.

The Transit Light Curve (TLC) Project

Matthew Holman, Harvard-Smithsonian Center for Astrophysics, USA
and
Joshua Winn

We present results from our recently initiated Transit Light Curve (TLC) Project, a program of long-term monitoring of transiting extrasolar planets. The principal scientific goals of this project are: (1) to refine the estimates of the physical and orbital properties of these planets, and (2) to search for variations in the transit times (Holman and Murray 2005, Agol et al. 2005) and light curve shapes that indicate the presence of additional, perturbing planets (Miralda-Escude 2002).

To date, we have observed transits of nine of the ten known transiting planets. To observe the bright northern hemisphere targets, we are using the KeplerCam on the 1.2-m telescope at the F.L. Whipple Observatory on Mt. Hopkins, AZ. For the fainter and southern hemisphere OGLE planets, we are using the Inamori Magellan Areal planets (Miralda-Escude 2002).

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In most cases, our photometry is accurate enough (1 mmag per minute of integration) that the resulting uncertainties in the planetary and stellar radii are dominated by the uncertainty in the assumed stellar mass, rather than by the statistical error. The noise in our KeplerCam photometry of XO-1b and TrES-1, in particular, is nearly Gaussian and time-averages down with the expected 1/sqrt(t) dependence all the way up to 30 minute time bins. This opens the possibility of detecting signals at the 0.1 mmag or even 0.01 mmag level, such as that produced by reflected light, by combining the results of many observations with small ground-based telescopes. Our transit timings for these systems are accurate to within 15 seconds.

Simultaneous Subaru/MAGNUM Observations of Extrasolar Planetary Transits

Norio Narita, University of Tokyo, Japan

We introduce our project of simultaneous Subaru/MAGNUM observationsof extrasolar planetary transits, designed for (i) transmission spectroscopy in order to search for absorption features due to planetary exospheres, (ii) precise radial velocity measurements in order to measure the Rossiter-McLaughlin effect. Our observing strategy of extrasolar planetary transits is to conduct simultaneous spectroscopic / photometric (optical+IR) observations, using the HDS of the Subaru 8.2 m telescope at Mauna Kea and the MAGNUM 2 m telescope at Haleakala, both in Hawaii. The simultaneous photometric monitoring will eliminate any uncertainty due to orbital ephemeris in our results, and it will also allow an independent determination of the transit depth and the limb-darkening parameters. In this workshop, we detail our strategy of observations and analyses, and also introduce current status and prospects of the project.

The X-ray irradiation and evaporation of close-in planets

Peter Wheatley, University of Warwick, Coventry, United Kingdom

The observed evaporation of HD209458b is believed to be driven by X-ray irradiation from the parent star. Models of evaporation suggest that long-term mass loss may be significant, raising the possibility that hot jupiters may have evolved from more massive objects and that hot neptunes could be stripped hot jupiters. Here we present the first X-ray detection of the parent star of a transiting extra-solar planet. We find that the parent star of HD189733b has an X-ray luminosity an order of magnitude higher than that of our Sun, and that the resulting irradiation is likely to drive evaporation at rates in excess of 10^{13}g/s, assuming maximum hydrodynamical blow-off from its atmosphere.

High precision secondary eclipse measurements in the near-infrared exoplanets

Ignas Snellen, Leiden Observatory, Netherlands

Recent Spitzer observations of the secondary eclipses of TrES-1, HD209458b, and HD189733b form the first direct measurements of thermal emission from extra-solar planets. However exciting, interpreting these results in terms of planet equipartition temperature and Bond albedo is complicated and model dependent. Ideally, more spectral points are needed including in the near-infrared. In this talk I will present several attempts to detect a secondary eclipse in K-band with UKIRT, VLT, NOT, WHT, and NTT, using a range of observing strategies. So far, the highlight forms a measurement of the secondary eclipse of OGLE-TR-113 at sub-millimagnitude precision, resulting in a tentative detection. Problems and challenges of high-precision K-band photometry are discussed, also in the light of future near-infrared transit surveys targeting low mass M-dwarfs.

XO Planet(s)

Peter McCullough, Space Telescope Science Institute, Baltimore, USA

We will review the unique characteristics of the XO Project to find transiting hot Jupiters. We will provide a status report and summarize results for the transiting system XO-1, including plans for and/or results from many ground-based observatories for photometry, HET spectroscopy, Keck AO, HST FGS and ACS, and SST IRAC.

The Spitzer Transiting Planet Target of Opportunity Program

Joseph Harrington, University of Central Florida
and
Debra Fischer, Drake Deming, L. Jeremy Richardson, Sara Seager, and Statia Luszcz

We have observed transits and eclipses of HD 209458b, TrES-1, HD 149026b, and HD 189733b with all three of the instruments on the Spitzer Space Telescope (not all combinations have yet been measured). Transit observations with IRS give extremely accurate radii, because of the lack of stellar limb darkening at this wavelength. Eclipses at all wavelengths measure intrinsic fluxes, which can be expressed as brightness temperatures, given a precise radius. These quantities are the best constraints to date on models of extrasolar planets. We will present our latest results at the conference. In our work, we have identified numerous undocumented Spitzer systematics. We have corrected all of these and have developed optimized strategies for making future observations. We now have a Spitzer program to observe both eclipses and transits of any new, sufficiently favorable, transiting planets with IRAC (3.6, 4.5, 5.7, and 8 μm), IRS blue peak-up array (16 μm), and MIPS (24 μm). The data and lightcurves from this program will be processed with our optimized pipelines and will be made public on a rapid timescale for all to use. Spitzer's design places tight constraints on when and how planets can be observed, so we encourage transiting-planet discoverers to join our collaboration early in the process of confirming a discovery.

New approach to the search for companions to extrasolar planets

J. Cabrera, Observatoire de Paris-Meudon, France
and
J. Schneider

We investigate a new approach to the detection of companions to extrasolar planets beyond the transit method. We advocate in passing the possibility of existence of "binary planets". We develop a method based on the imaging of a planet-companion as an unresolved system (but resolved from its parent star). It makes use of the planet-companion "mutual phenomena", namely mutual transits and mutual shadows. We show that companions can be detected and their radius measured down to lunar sizes.

Asteroseismology: A unique tool for planet transits

Dennis Stello, School of Physics, University of Sydney, Australia

The study of stellar oscillations - Asteroseismology - has revolutionized our understanding of the physical properties of the Sun, and similar potential for other stars has been demonstrated in recent years. In particular, asteroseismic studies can constrain the stellar size, temperature and composition, which are important parameters to our understanding of planetary structure and evolution. This makes asteroseismology a very powerful tool to complement planetary transits. As an example, the transit measurements alone does not give the size of the planet unless the size of the host star is known, which again requires a known distance to the system. Transit measurements will therefore often require additional investigations to establish the size of the planet. With asteroseismology we can determine the size of a star to very high precision (3-4%) using only the photometric transit measurements.

Statistics and Simulations of Transit Surveys

Scott Gaudi, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA

The yields from transit surveys can be used to constrain the frequency and statistical properties of extrasolar planets. Conversely, planet frequencies can be used to estimate expected detection rates, which are critical for the planning and execution of these surveys. Here I review efforts to accomplish these two related goals, both of which generally require realistic simulations of transit surveys. Early attempts to predict planet yields generally resulted in overly optimistic detection rates that have not been realized. I point out where these early estimates likely went wrong, and then describe more recent, detailed calculations that should provide more accurate rates, which can be critically compared to observed yields. Finally, I discuss what the results of successful surveys have already taught us about the frequency of close-in planets, and compare these results with radial velocity surveys. Throughout I will try to highlight the difficulties and complications with simulating and interpreting transit surveys, in particular strong biases and sensitivity to detection thresholds.

On the Potential of Transit Surveys

Michaël Gillon, Geneva Observatory, Switzerland
and
Pierre Magain, Frédéric Courbin

So far, the transit method has allowed the detection of only seven giant planets, despite the numerous ground-based surveys using or having used this technique. This yield is very low compared to the initial expectations mentionned in the proposals of the several dozen past and present transit ground-based surveys (see e.g. Horne 2003). While two ambitious space missions, CoRoT (Baglin et al. 1998) and Kepler (Basri et al. 2005) are planned for the next future, it is important to properly estimate the actual potential of the transit method. A partial explanation to the lack of success of transit surveys could come from the influence of the crowding on the photometric accuracy. Indeed, transit surveys have to observe several thousands of stars at once to compensante for the rarity of searched events, and two main strategies are possible to achieve this goal, given existing instruments. The first one is to observe a deep, very dense and relatively small field using a median to large telescope, while the second one is to use a small telescope to observe a wide and shallow field. It is obvious that surveys using the first strategy have to deal with a relatively high level of crowding. Nevertheless, the computation of the potential of the second kind of survey should also take into account blends, as such surveys generally defocus to keep a good spatial and temporal sampling. Another cause of the excess of optimism of former simulations could come from the fact that they generally did not take into account the influence of systematics on the photometric accuracy, only considering white noises (photon noise, read-out noise, etc) and sometimes blue noises as scintillation. Nevertheless, systematic effects (instrumental, atmospheric, etc) give rise to the presence of red noises in the light curves which is not perfectly corrected by the use of differential photometry, decreasing thus the sensitivity of transit surveys (Pont et al. 2006). We have computed the final harvest of different representative surveys, both ground-based (small deep field and wide shallow field) and space-based (CoRoT and Kepler), with and without taking into account the crowding and using several levels of systematics. Our results allow to analyze the influence of twese two effects on transit surveys and to get a realistic estimate of the potential of the method . We also used these results to estimate the potential of fictitious ground-based surveys optimized to have a potential significantly higher than existing ones.

Monte Carlo models of giant planet formation

Willy Benz, University of Bern, Switzerland

Monte Carlo models of giant planet formation based on the so-called core accretion model allow us to generate synthetic planet populations that can be compared to the actually observed population. From these comparisons, we can, on one hand, extract in a statistical sense important constraints on the formation models. On the other hand, given an observational bias, we can predict the population of planets that should be observable. Hence, these models provide an important tool for improving our understanding of planet formation as well as optimizing future observational campaigns.

Constraints on the Compositions of Transiting Planets

Tristan Guillot, Observatoire de la Côte d'Azur, Nice, France

I will discuss how the composition of planets can be obtained when they are discovered transiting in front of their star. A global composition can be inferred by the knowledge of their radius and mass, but numerous uncertainties come into play. A very detailed study of the parent star and analyses on a statistically significant number of planets are necessary to overcome uncertainties inherent to a lack of knowledge of the input physical parameters. I will also discuss how measurements of the properties of the atmosphere by transit (primary or secondary) spectroscopy and photometry will help us to precise our understanding of extrasolar planets. sense are are also limited discovery of transiting

Hot Jupiter Model Atmospheres and Infrared Spectra

Jonathan Fortney, NASA Ames Research Center, Mountain View, USA

The Spitzer Space Telescope has allowed observers to detect thermal flux from the atmospheres of transiting hot Jupiters around the time of secondary eclipse. We present model atmospheres of several of these planets and compare our computed infrared spectra to recent Spitzer Space Telescope and ground-based infrared observations. One-dimensional radiative-equilibrium models yield infrared planet-to-star flux ratios that are in general a good match with the Spitzer data published to date, but perhaps not to ground-based upper limits. We also explore spectra as a function of orbital phase for a three-dimensional dynamical atmosphere model of planet HD209458b. The day-side temperature structure of the dynamical model, and therefore the resulting spectra, is quite different than other published models. Observed flux a function of orbital phase should be very sensitive to departures from equilibrium CO/CH_4 chemisty. We disuss prospects for observing atmospheric temperature contrasts as a function of orbital phase.

Transits in Globular Clusters

David Weldrake, Max-Planck Institute for Astronomy, Heidelberg, Germany
and
Penny Sackett, Mount Stromlo Observatory, Australia
Terry Bridges, Queens University, Canada.

A large ground-based search for transiting Hot Jupiter planets in the outer haloes of the globular clusters 47 Tucanae and ω Centauri has been performed. The aim was to help understand the role that environmental effects play on Hot Jupiter formation and survivability in globular clusters. Using the ANU 1m telescope and a $52' \times 52'$ field, a total of 54,000 solar-type stars were searched for transits in both clusters with fully tested transit-finding algorithms. Detailed Monte Carlo simulations were performed to model the datasets and calculate the expected planet yields. Despite a detailed search, no planet-like candidates were identified in either cluster. When combined with previous theoretical papers of planet survivability, as well as the HST null result in the core of 47 Tuc, this lack of detections in the uncrowded outer halo of both clusters indicates that system metallicity is the dominant factor inhibiting Hot Jupiter formation in these environments.

KEPLER MISSION STATUS

William Borucki, NASA Ames Research Center, Mountain View, USA
and
D. Koch, G. Basri, T. Brown, D. Caldwell, J. Christensen-Dalsgaard, W. Cochran, E. Dunham, T. Gautier, J. Geary, R. Gilliland, J. Jenkins, Y. Kondo, D. Latham, J. Lissauer, D. Monet

Kepler is a Discovery-class mission designed to determine the frequency of Earth-size and smaller planets in and near the habitable zone (HZ) of spectral type F through M dwarf stars. The instrument is a wide field-of-view (FOV) differential photometer with a 100 square degree FOV that continuously and simultaneously monitors the brightness of 100,000 main-sequence stars with sufficient precision to detect transits by Earth-size planets orbiting G2 dwarfs. The brightness range of target stars is from visual magnitude 9 through 15. The photometer is based on a modified Schmidt telescope design that includes field flattener lenses near the focal plane. The corrector has an aperture of 0.95 m with a 1.4 m diameter F/1 primary. This aperture is sufficient to reduce the Poisson noise to the level required to obtain a 4σ; detection for a single transit from an Earth-size planet transiting a 12th magnitude G2 dwarf with a 6.5 hour transit. The focal plane is composed of forty-two 1024x2200 backside-illuminated CCDs with 27 μ; pixels.

The spacecraft is placed in an Earth-trailing heliocentric orbit by a Delta II 2925-10L launch vehicle. The heliocentric orbit provides a benign thermal environment to maintain photometric precision. It also allows continuous viewing of a single FOV for the entire mission without the Sun, Earth or Moon obtruding. Only a single FOV is monitored during the entire mission to avoid missing transits and to maintain a high duty cycle.

A FOV centered on a galactic longitude of 76.3 deg and latitude of + 13.5 deg satisfies both the constraint of a 55 degree sun-avoidance angle and provides a very rich star field. This FOV falls within the Cygnus-Lyra constellations and results in looking in a tangential direction from the galactic center. A ground-based observation program led by David Latham (SAO) and Tim Brown (HAO) is underway to observe 107 stars in the FOV brighter than 19th magnitude. The resulting catalog allows the Kepler Mission to choose only F through M dwarfs and to exclude giants and early spectral types from the target list.

At any given time 512 stars will be observed at a 1-minute cadence to obtain p-mode data from a variety of stars; over the lifetime of the mission several thousand stars will be observed in this manner. Asteroseismic analysis of these data will yield detailed information about the properties of such stars, including a substantial number with planets.

Photometry is not done on the spacecraft. Instead, all of the pixels associated with each star image and the collateral, bias, and smear pixels are sent to the ground for analysis. This choice allows many different approaches to be used to reduce systematic errors.

There will also be a Guest Observer program, whereby scientists can propose to observe targets that are not being observed as part of the Kepler planet search. The mission is now in Phase C/D development and is scheduled for launch in 2008.

Hot Exoplanet Transit Experiment (HETE) Sky Survey : Present and Future Space-based All Sky Surveys

George Ricker, Massachusetts Institute of Technology, Cambridge, USA
on behalf of the HETE Science Team

Identification of new, bright transiting systems is of primary importance for progress in comparative exoplanetology. Only for such bright systems can the complete panoply of detailed follow-up observations —especially ultra-high resolution spectroscopy – be carried out. We have proposed that the operational High Energy Transient Explorer (HETE-2) satellite, originally launched in 2000, be re-targetted to search for such bright systems. As a mission-of-opportunity under the NASA Discovery program, such a re-christened *Hot Exoplanet Transit Experiment* (HETE) would utilize the wide-field (30 $\deg^2$) optical cameras on the currently-operating HETE-2 satellite to survey 30,000 $\deg^2$ of sky for hot Jupiters transiting nearby bright stars. The mission goal is to discover 6–12 new systems brighter than 10th magnitude. Such systems are quite rare: in order to discover these new systems, our space-based sky survey will examine $\sim$100,000 bright stars, and will provide $\sim$2 billion accurate photometric measurements. The HETE-2 satellite has been successfully operating in orbit for five years, and we foresee no obstacles to continuing its successful operation for the additional five years needed to accomplish the proposed optical survey. No modifications to the spacecraft software will be required for the new observing mode, and our analysis of images obtained over the past five years shows that we can produce stellar light curves with the required photometric precision of 0.2 percent down to Sloan r = +10 mag. In addition to describing the HETE optical mission, we will also discuss a concept for a future "next generation" transiting exoplanet survey satellite with an etendue $\sim$ 1000 times larger than HETE, which could efficiently search the entire sky for exoplanets with orbital periods as long as $\sim$ 60 days and transit depths of < 0.1 percent.

50,000 Transiting Planets from the Microlensing Planet Finder Mission

David Bennett, University of Notre Dame, USA

The Microlensing Planet Finder (MPF) mission is a proposed mission that is optimised to find planets down to 0.1 Earth masses at all separations > 1 AU by continuous photometric monitoring of more than 100 million Galactic bulge stars. However, it should also detect the transit signals of more than 50,000 giant planets orbiting the Galactic bulge target stars. The main challenge for MPF is to distinguish the transiting planets from false positives.

A STEP: an Antarctic Search for Transiting Extrasolar Planets

François Fressin, Observatoire de la Cote d'Azur, Nice, France
and
Tristan Guillot, Franois Wavier Schmider, Karim Agabi, Claire Moutou, Franois Bouchy, Michel Boer, Frédéric Pont, Anders Erkson, Heike Rauer and the A STEP team.

We present "A STEP" (Antarctica Search for Transiting Extrasolar Planets), a project dedicated to the search for planetary transits from Antarctica. The project consits of a semi-automatic 40 cm teslescope equipped with a 4-million pixel CCD installed at Dome C. the site offers crucial assets for a ground based exoplanet transit search : uninterupted phase coverage, excellent weather, low air mass variations and reduced scintillation. This sytem would be able to detect Pegasids transiting in front of stars as faint as magnitude sixteen and could also detect smaller planets in close-in period around brighter stars. This short term project is meant to be a photometrics qualiyer for the site and the first stage of a massive detection campaign. A mid-term objective of 1000 detections for 2012 could be achieved either with many small telescopes or with a large Schmidt telescoep with a large field of view. The telescope is relatively simple and cost-effective, and has the double purpose of qualifying the site and obtaining first-class scientific results. Our team is already familiar with transit detection with an automated telescope and cold temperature qualification.

SkyMapper Search for Transiting Hot Jupiters

Daniel Bayliss, Mount Stromlo Observatory, Canberra, Australia

SkyMapper is a soon-to-be built 1.3m survey telescope which will be located at Siding Spring Observatory in New South Wales, Australia. SkyMapper will combine a massive 5.7 square degree field of view with a high quality mosaic CCD array. We will be using SkyMapper to conduct a deep, wide-field transit search for Hot Jupiters in the Galactic Plane. In this talk we will discuss the expected capabilities of the SkyMapper telescope in relation to our transit search. We also describe preliminary work now underway to choose the most appropriate field and observational strategy for the search.

Pan-Planets : a Massive Search for Hot Jupiters

Cristina Afonso, Max-Planck für Astronomie, Heidelberg, Germany

PANSTARRS1 (PS1) is a 1.8 m telescope located at the Lure Observatory in Haleakala. Maui, Hawaii. Among other major science goals, PS1 are expected to perform a search for extra-solar planets with the transit method, called the Pan-Planets project. Pan-Planets will have an exceptional potential for a transit search of Hot Giant Planets, since it combines a large field of view equal to 7 square degrees, a significant telescope size of 1.8m, with a fast read-out of the CCD camera (few seconds), and a quick slew of the telescope. These features allow the monitoring of several hundred thousand stars in one survey field, and million of stars in two or more fields, at least a factor of 10 more than in the case of the OGLE III project that found five of the ten known transiting planets. Three campaigns during three years are expected to yield 100 Hot Jupiters.

Posters : 1. Transit Surveys and Observing Strategies

Status of SuperWASP-South

David Robert Anderson, Keele University, United Kingdom

SuperWASP (Wide Angle Search for Planets) we are looking for Hot Jupiters using the transit method with two instruments: one on La Palma, and one in South Africa.

Keele University is responsible for the operation of the southern instrument, SWASP-South, and the reduction of its data. Here we present the status of the instrument and discuss the data quality acheived from the site.

Results from Lowell Observatory's Transit Surveys in Auriga and Cygnus

Georgi Mandushev, Lowell Observatory, USA

We present results from the PSST transit surveys of dense Milky Way fields in Auriga and Cygnus, two of the first fields observed by Lowell Observatory's Planet Search Survey Telescope (PSST). In each field there are about 18000-20000 stars with precise enough photometry to detect 0.5%-3% transit events. In each field we discovered about 100-120 planetary transit candidates, none of which was found to be a true planet. We discuss the implications of this negative result, as well as the overall photometric quality and efficiency of transit searches in crowded fields.

Near Infrared Monitoring of Ultra Cool Dwarfs: Searching for Transiting Companions

Cullen Blake, Harvard Smithsonian Center for Astrophsyics, Cambridge, USA

We present initial results from a project designed to monitor Ultra Cool Dwarfs (UCDs) of late-M to early-L spectral type in the near infrared with the long-ter m goal of detecting close-in, planetary companions to small stars. Owing to the small radii of the UCDs, data obtained with the Peters Automated Infrared Imaging Telescope (PAIRITEL) should allow us to detect terrestrial transiting planets. A sample of 20 objects were monitored nightly over a period of up to six months with a typical precision of $< 2\%$. We find that UCDs represent photometrically stable targets suitable for transiting planet searches in the near infrared and present data from three targets with representative time coverage and photometric behavior. The likelihood of detecting an existing close-in planet in the PAIRITEL data using this observational strategy is simulated and found to be between 10% and 1% per target. We demonstrate that in 15 min intervals we achieve 8 mmag rms over a period of 100 days, suggesting sensitivity to Earth mass planets. A campaign to monitor a large sample of UCDs provides a viable method for detecting terrestrial planets, super-Earths, and Neptunes potentially located in the habitable zones of their hosts.

Searching for Transits in the Lupus Galactic Plane

David Weldrake, Max Planck Institut fur Astronomie, Heidelberg, Germany
and
Daniel Bayliss, Penny Sackett, Brandon Tingley, Mike Bessell

A 52×52 field in the Lupus Galactic Plane was observed with the ANU 1m telescope for 53 nights during 2005 and 2006 in a search for transiting Hot Jupiter planets. A total of 2200 images were obtained of this field. Via an application of differential photometry, 120,000 stars have been sampled. Of these, $\sim$26,000 have sufficient photometric accuracy ($\leq 2.5\%$) with which to perform a transit search. Ongoing analysis has led to the identification of three transit candidates, the subject of further investigation.

This poster presents an overview of the project, the current candidates, and the results of radial velocity analysis performed on two (Lupus-TR-1 and Lupus-TR-2) with the 4m AAT telescope and UCLES. Lupus-TR-1 is a likely blended system, based on the lack of detectable velocity variations. The third, Lupus-TR-3 (P=1.8d, V=17.0), is a strong candidate for a new giant planet, with photometry consistent with a solar-type star and a near centrally-crossing transit of a planet of 1.3 Jupiter radii. Further observations are planned to determine its nature.

Optimal field selection for OmegaTranS

Johannes Koppenhöfer, Max-Planck Institute for Extraterrestrial Physics, Germany

The OmegaCam-Transit-Survey is a search for transiting extra-solar planets and will start with a first monitoring campaign in spring 2007 using 3 weeks of GTO-time at the new VLT Survey Telescope (VST) on Paranal. We present our optimal field selection based on multi-color imaging and simulations. The best target fields for a transit search are the ones with the highest number of F-, G- and K- dwarfs. Recent results show that these are located a few degrees off the Galactic midplane and are not the ones with the highest total number of stars. According to our estimates a planet search can be optimized by a factor of 2 by using an optimimal field selection.

WIFSIP: the wide-field CCD photometer for the robotic telescope STELLA

Heidi Korhonen, Astrophysikalisches Institut Potsdam, Germany
and
K. G. Strassmeier, T. Granzer, A. Staude, M. I.Andersen

STELLA is an observatory on the Spanish island of Tenerife, hosting two robotic 1.2 meter telescopes (STELLA-I and STELLA-II) that operate in fully unattended mode. From mid 2007 onwards STELLA-I will host the Wide Field Stella Imaging Photometer (WIFSIP). This instrument is envisioned to provide 1 milli-magnitude photometric accuracy over a field of view of 22x22 arc-minutes with a sampling of 0.3 arc-seconds/pixel. The photometer will be equipped with Stromgren, Halpha, Johnson-Bessel and Sloan filters. To fully take advantage of this robotic observatory, an automatic data reduction pipeline is also being implemented.

One of the core science projects for WIFSIP is the time series study of open clusters of different ages. This study is mainly intended for studying the stellar properties and magnetic activity in open clusters of different ages up to 2 Gyr, but the long photometric time series obtained are also suited for finding planet transits. Another possible science target for WIFSIP is a pre-mission definition of the targets in the Kepler field. This field is ideally located on the sky for observations from the STELLA observatory.

Update and recent results of the STARE instrument

Markus Rabus, Instituto de Astrofísica de Canarias, Spain
and
Tim Brown, Hans Deeg, Juan Antonio Belmonte, José Manuel Almenara Villa

The STARE telescope at the Teide Observatory, Spain, is maintained by the "Instituto de Astrofisica de Canarias". The mission of STARE is to find exoplanets transiting their parent star. Therefore, the telescope observes stars in different fields over a certain period of time. Differential photometry is applied to get the light curve of the stars. The obtained light curves are searched for possible transits of planets and different techniques, to discard stellar binaries and diluted triples systems, are applied. The STARE instrument has been updated in spring 2006 and forms part of the TrES network, which consists of two more telescopes located in the USA (PSST, Lowell Observatory; Sleuth Mt. Palomar). All telescopes observe the same fields for typically two months, which will help to obtain better detection probabilities and reduce gaps in the data due to bad weather conditions. In this poster results from recent observations and an overview over STARE's update will be given.

The WHAT Project - Search for Variables in a Single Field

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and
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We describe WHAT, a small-aperture short focal length automated telescope with an 8.2 deg x 8.2 deg field of view, located at the Wise Observatory. The system is similar to the members of HATNet (http://cfa-www.harvard.edu/ gbakos/HAT/) and is aimed at searching for transiting extrasolar planets and variable stars. Preliminary results of 3892 exposures of a single field are presented. With 5 min integration time, the telescope achieved a precision of a few mmag for the brightest objects. Results of our periodicity analysis are presented, where detected modulations (peak to peak) are down to 0.01 mag. All periodic variables are presented in a downloadable format at http://wise-obs.tau.ac.il/ amit/236/.

Byproducts of the UNSW Search for Extrasolar Planet

Jessie Leigh Christiansen, University of New South Wales, Australia

The University of New South Wales is undertaking a search for transiting extrasolar planets using the Automated Patrol Telescope at Siding Spring Observatory, Australia. In order to detect transiting planets, very precise, long series photometry must be performed on tens of thousands of stars. Inevitably many other varieties of variable stellar phenomena will also be monitored, including eclipsing binaries, contact binaries and numerous classes of variable stars. Some of these objects have the potential to be quite interesting; for instance eclipsing low-mass binary stars are extremely valuable for constraining theoretical models of star formation due to the precise constraints on the masses and radii of the components. We present here lightcurves of three eclipsing binary systems with components of low mass - a K-K star system, a G-M star system, and a G-brown dwarf system. Radial velocity curves are also included for the latter two systems.

Radial Velocity and Transit Search (RATS)

Valentina Granata, Padova University, Italy
and
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The orbital characteristics of the extrasolar planets found up to day, create difficulties to the classical paradigm of the planetary formation. Radial velocities technique (which are responsible of 90% of detections) does not allow to have information about the physics of planets which is important to disentagle the dichotomy among core accretion model and disk instability model. CCD Cameras mounted on wide field of view telescope allow to monitor simultaneously a large amount of star light curves to search for planetary transits. RATS project, started in February 2005, is a collaboration between several INAF Observatories (Padova, Catania, Napoli, Palermo), the Astronomy Department and Physics Department of the University of Padova and ESA, devoted to search for extrasolar planets exploiting the transit photometric technique together with spectroscopic follow up strategy for reconnaissance of false alarms. The photometric survey will conduct with the 67/92 Schmidt Telescope of C.Ekar equipped with the wide field of view telescope allow to monitor simultaneously a large ammount of star light curves to

search for planetary transits. RATS project, started in February 2005, is a collaboration between several INAF Observatories (Padova, Catania, Napoli, Palermo), the Astronomy Department and Physics Department of the University of Padova and ESA, devoted to search for extrasolar planets exploiting the transit photometric technique together with spectroscopic follow up strategy for reconnaissance of false alarms. The photometric survey will conduct with the 67/92 Schmidt Telescope of C.Ekar equipped with the EDDINGTON frame transfer CCD. The spectroscopic follow up will be made using the echelle spectrograph (modified for fiber feding) at the Copernico Telescope at the same site. The aim of the project is twofold. The first aim is to find almost 10 (goal 20) new giant planets in 5 years and the second is to test the observing mode, the data reduction and data archiving of a transit search space mission.

Posters : 2. Transit Identification: Photometry, Systematics, and False Postives

SuperWasp Candidate Analysis and Follow-up

Becky Enoch, Open University, United Kingdom

During 2004, SuperWASP-North (La Palma) observed 6.7 million stars between V=8-15mag for up to 5 months with the aim of identifying new bright transiting extra-solar planets. With such a huge volume of data, a creative yet thorough approach to transit detection was required. In this poster we discuss the adapted BLS transit search algorithm, 'hunter', plus sophisticated filtering procedure we have developed to extract genuine transiting exoplanets and reject both data artefacts and astrophysical false positives as far as possible. The 2006 Radial Velocity montoring campaign to follow up some of the best planetary candidates is also detailed.

RATS: The photometric data reduction automatic pipeline

Valentina Granata, University of Padova, Italy

The aim of the pipeline is to obtain the light curves of each star in the planetary transit search field of view within the RATS project. The in put files for the pipeline are: a list of images taken at Schmidt Telescope of Asiago (INAF), a reference masterlist of stars and three files containing the optional parameters for the DAOPHOT photometry package. The masterlist is previously obtained from a photometric characterization of the field and it contains the coordinates and the colors B, V, R and I of the field stars. Iteratively, for each frame we find the center of each defocused star in every image and we match with DAOMATCH and DAOMASTER each frame with the first one, choosen as a reference. Then we transform the coordinate of each stars in the matched frames in the spatial reference system of the masterlist and we re-run DAOPHOT to obtain the new photometry with the transformed coordinates. In the next step we store the output files with the light curves, one for each star in all the images. Finally, we calculate iteratively the mean magnitude with which we correct the magnitude of the stars. The most interesting results obtained from the pipeline are shown.

Comparison of false alarm rejection methods used in CoRoT Blind Test 2

Jose Manuel Almenara Villa, Centro de Astrofísica de Canarias, Spain
and
H.J. Deeg and the COROT team.

Transit searches provide a large number of planet candidates. Before attempting follow-up observations, a best effort should be spent in classifying the lightcurves, rejecting false alarms and selecting the most likely ones for real planets. A number of analysis tools have been developed with these objectives. These tools consider parameters like transit duration, depth, stellar density, transit shape and color dependence of the candidate lightcurves. In this poster, we apply these tests to simulated multi-color lightcurves from CoRoT blind test 2, which contains simulated planet transits and several configurations of impostors. Their comparison gives indications of the various tools' classification and false-alarm rejection capabilities.

SuperWASP Candidate selection

David Wilson, Keele University, United Kingdom

Photometric surveys for transiting exoplanets produce large numbers of stars which show transit-like lightcurves, many of which are not exoplanet transits. Eclipsing binaries are a common source of these "mimics", particularly when the image of the star is blended with another star or where one of the components is a giant star. We present a technique to automatically sort and prioritise candidates for follow-up observations. By combining a variety of existing catalog data with transit lightcurve parameters it is possible to exclude unlikely stellar hosts such as known variables and doubles, blended stars and red giants, and to prioritise candidates based on their suitability.

Also discussed is a method to measure the probability that a transit-like lightcurve is due to a planetary transit or a stellar eclipse mimic using a boot-strap technique, i.e., by fitting synthetic lightcurves with simulated transits and eclipses that have noise and sampling characteristics similar to the actual data.

Posters : 3. Characterisation: Follow-up Observations and Determination of Planetary System Parameters

Follow up observations for transiting extrasolar planet XO-1b

José Miguel Fernandez Contreras, Harvard Smithsonian Center for Astrophysics, USA

Follow up observations for transiting extrasolar planet XO-1b Abstract: We present new high-quality light curves for the transiting planet XO-1b obtained in the SDSS z band using KeplerCam on the 1.2-m telescope at the Whipple Observatory on Mount Hopkins, Arizona. The z band was chosen to minimize the effects of limb darkening. We use the new observations to update the radius and orbital inclination of the planet. We also present mass and radius determinations for some M dwarfs eclipsing F and G stars originally identified by the Vulcan, TrES, and HAT wide-angle surveys. These have light curves which are almost indistinguishable from transiting giant planets. In those cases where the rotation of the primary star has been synchronized with the orbital period we can use the observed broadening of the spectral lines to derive the radius and mass of the host star, and therefore the mass and radius of the unseen M dwarf.

Precise Photometry of Extrasolar Planet Transits with SOFIA

Edward W. Dunham, Lowell Observatory, USA

Precise photometric observations of transiting extrasolar planets can provide a wealth of data on the nature of these objects. Results such as planetary radius, orbital inclination, stellar limb darkening, evidence for planetary satellites or rings, and atmospheric composition can be found from the transit observation alone. When combined with high quality radial velocity data the mass and density of the planet can be determined. Infrared observations of the secondary minimum provide a means to determine the temperature of the planet and allow limits on the orbital eccentricity to be defined. Perturbations by other planets in the system can be found by variations in transit timing over a period of years. We anticipate that very high quality transit data can be obtained with SOFIA using the HIPO and FLITECAM science instruments. At present this work is limited to the two brightest known transiting planets, but the field is so active that many additional targets will be found. The ongoing spectroscopic

planet search programs and several ongoing transit search programs designed specifically to find objects bright enough for detailed follow-up work are expected to add numerous objects to this list over SOFIAś lifetime. The Kepler mission will be launched and complete its mission while SOFIA is flying, producing numerous exciting opportunities for additional work.

A Ground-Based Search For L Band Thermal Emission From TrES-1

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and
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Recent observations using the Spitzer Space Telescope have detected the thermal emission from several transiting planets. Although the current measurements allow us to fit basic atmospheric models to the data, the placement of the Spitzer bandpasses also limits the information which can be obtained from these observations. Models predict that for hot Jupiters like TrES-1 there will be a strong emission feature at 4 microns, but the center of this feature lies on the interface between Spitzer's 3.6 and 4.5 micron bandpasses. Additionally, the Spitzer photometry only provides bandpass- integrates fluxes, while the ultimate goal is to compare the observed spectrum of a planet to model spectra. We used the Near InfraRed Imager (NIRI) on Gemini North to observe TrES-1 and a close companion star (2MASS 19041058+3638409, 44" distant) simultaneously during a secondary eclipse on UT 2006 May 11, and obtained a series of 326 L-band spectra of each star spanning the wavelength range from 2.9-4.3 microns. The simultaneous observation of a second star allows us to calibrate out time-dependent variations in the common-mode terrestrial atmospheric absorption and seeing effects. We use optimal spectral extraction and bin each individual spectrum (corresponding to a single point in time) into several spectrophotometric bandpasses. We take the ratio of the fluxes from TrES-1 to the companion star as our final timeseries for each bandpass. We present the preliminary results of our analysis in this poster.

NIR Imaging Spectroscopy of HD209458b

Daniel Angerhausen, Physikalisches Institut University of Köln, Germany

We present first results of an exploratory study to use integral field spectroscopy to observe extrasolar planets. We focus on transiting "Hot Jupiters" and emphasize the importance of observing strategy and exact timing. We demonstrate how integral field spectroscopy compares with other spectroscopic techniques currently applied. We have tested our concept with a time series observation of HD209458b obtained with SINFONI at the VLT during a superior conjunction.

Radial Velocity Follow-up of transit candidate MACHO.5389

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and
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We present preliminary results on the radial velocity follow-up of a planetary transit candidate (P=2.43d, V=15.4) detected during the MACHO project. The photometry is consistent with a moderately grazing transit of an object with radius $1.8R_J$ orbiting a K dwarf star, and is the brightest best candidate detected from MACHO. Results from the MPG/ESO 2.2m telescope and FEROS (R=48,000, $\sim$ 10m/s precision) in May and July 2006 display a radial velocity variation with amplitude $\sim$ 600m/s with the same period as the transit, and a solar-type primary. This is consistent with an orbiting companion of mass $\sim$ $4M_J$. However, the July observations display an additional secondary long-period variation with amplitude of several km/s, indicating the presence of a third body. The system is likely a

low mass (possibly brown dwarf) eclipsing binary orbiting the solar-type primary. Further observations are planned to fully understand the system.

High temporal resolution transit observations with ESA's cryogenic camera

Anamarija Stankov, European Space Agency/ESTEC, Netherlands
and
R. Schulz, C. Erd, D. Martin, T. Oosterbroek, P. Verhoeve

The ESA Optical Ground Station 1-m telescope (OGS) at Observatorio Del Teide, Tenerife , offers a unique possibility to perform extremely high temporal resolution observations (5 microseconds) of exo-planet transits while simultaneously performing low resolution broad band spectroscopy. This detailed determination of the transit profile is achieved through the use of a newly developed cryogenic camera based on superconducting tunnel junction technology - S-CAM3. Its field of view is 12x10 arcsecs. This photon counting camera provides a unique capability to derive low resolution spectra between 320nm and 800nm with a resolution of 35 nm at 500nm wavelength with a time resolution limited only by Poissonian photon counting statistics. In May 2006 we observed the central part and egress of the transit of TrES-1 (GSC 02652-01324 an 11.4th magnitude K0V type star) with S-CAM3 coupled to the OGS telescope which provided an observed count rate of 12000 counts/sec, leading to a light-curve having a time resolution of seconds simultaneously in a number of broad wavelength bands. In addition, we observed the weak transit of HD 149026 in order to establish the S-Cam3 instrument limitations associated with future observations of stars having very shallow transits. In August 2006 we are going to observe 2 northern stars at the predicted times of three planetary transits (TrES-1 and HD 209458). The analysis of these light curves will enable us to determine the radius of the planet to a rather high accuracy independent of the size of the host star as well as possibly studying the atmosphere of the transiting planet.

Posters : 5. Planetary Atmospheres and Impact of Transits on Theoretical Predictions of Planet Formation and Composition

Transiting Planet Simulations from the All Sky Extrasolar Planets Survey (ASEPS)

Stephen Robert Kane, University of Florida, USA
and
Jian Ge

Of all the methods used for the detection of extra-solar planets, the radial velocity technique is still the dominant source of extra-solar planet discoveries. Furthermore, many of the planets discovered are hot Jupiters in 3–5 day orbits with ∼10% chance of transiting their parent star. Thus many of the hot Jupiters discovered via radial velocity surveys are expected to also exhibit a photometric transit signature. However, radial velocity surveys for extra-solar planets generally require substantial amounts of large telescope time in order to monitor a sufficient number of stars due to the single-object capabilities of the spectrograph. A multi-object Doppler survey instrument has been developed, building on the success of the prototype instrument, Exoplanet Tracker (ET), which is based on the dispersed fixed-delay interferometer design. This new instrument began use in 2006 with the Sloan 2.5m wide-field telescope to perform a wide-angle survey for extra-solar planets, dramatically increasing the detection rate using the Doppler method. We present simulations of the expected results from the Sloan Doppler survey based on calculated noise models and sensitivity for the instrument and the known distribution of exoplanetary system parameters. We have developed code for automatically sifting and fitting the planet candidates produced by the survey to allow for fast follow-up observations to be conducted. Considering the expected high number of hot Jupiters from the survey, a transit ephemeris is automatically calculated by the radial velocity code for each candidate and updated when new data becomes available. Early photometric follow-up of planet candidates during the predicted transit windows will indicate whether or not the planet's orbit is favourably inclined for transits to be visible. The techniques presented here may be applied to a wide range of multi-object planet surveys.

Posters : 6. Future Surveys

ICE-T: a planet finder for Dome C

Klaus G. Strassmeier, Astronomisches Institut Postdam, Germany

ICE-T is a fully robotic telescope for astrophysics and atmospheric research in Antarctica and is based on the "Star Photometer" project within TAVERN, the quantification of tropospheric aerosol and thin clouds variability over the east Antarctic plateau including the radiation budget. This poster introduces the joint science case, the conceptual design, and the anticipated data handling plan. ICE-T consists of two 60cm optical ultra-wide-field Schmidt telescopes and one 18cm narrow-field Maksutov spectrophotometric telescope on a single mount for theShee Antarctic station Concordia at Dome C.

Posters : Miscellaneous

Constraining the abundance of M-dwarf planets from Microlensing observations

Daniel Kubas, European Southern Observatory, Chile

We present constraints on the Galactic abundance of planets around M-dwarfs based on observations of microlensing events obtained by the PLANET (Probing Lensing Anomalies NETwork) team during the seasons from 1995-2005. Despite the recent discoveries of three Jovian type gas giants and two sub-Neptune mass planets, the absence of planetary signatures in the microlensing light curves prevails in the data sample. We find that less than 1/4 of M-dwarfs have Jovian companions within 1-4 AU (at 95% confidence) and that sub-Neptune mass planets are at least 10 times more frequent in this orbital range. These findings are consistent with predictions of current planet formation theories.

Astrometry on wide-field images

Andres Pal, Lorand Eötvös University, Hungary
and
Gaspar Bakos

We present a general two-dimensional catalogue matching algorithm that can efficiently be applied for wide-field astrometry where the acquired images are strained by distortions due to the large field-of-view. The algorithm is able to derive the transformation between a reference catalogue and the images up to arbitrary polynomial order. Our method is applied successfully in the Hungarian-made Automated Telescope Network project both in real-time astrometrical guiding of the telescopes as well as during the reduction of the data.

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Internet Connection

For wireless access to the MPIA network, please configure your laptop as follows:

- proxy for web access must be set to : **web-proxy** using port : **3128**
- SSID should be set to **MPIA**

Getting to/leaving the Max-Planck Institut für Astronomie

Max-Planck-Institut für Astronomie (MPIA) is located on the Königstuhl, which is the hill above the castle. It takes approximately 20 to 30 minutes to go by car/ public transportation from Bismarckplatz (city center) to the institute. The MPIA gates are open on working days from 6:30am to 6:45pm.

Getting to/from MPIA (Königstuhl) from/to Heidelberg Hauptbahnhof (main train station) or from/to Bismarckplatz (city center main plaza):

- By Bus shuttle organized by the Workshop

  A bus will be made available to transport the conference participants from/to Heidelberg to/from MPIA. The bus will be leaving from the IBIS hotel, next to the central train station (Hauptbahnhof). There will be an additional stop at the parking lot next to the a big shop called "Bauhaus" (see attached map, 10 min. walk from the Neckar and 2 min. from Kohler hotel), located at "Kurfürstenanlage 11".

  The bus is scheduled :

  - to lave the IBIS hotel and Bauhaus as follows:
    * Monday, September 25 : 7:45am (IBIS), 7:50am (Bauhaus)
    * Tuesday, September 26 : 8:15am (IBIS), 8:20am (Bauhaus)
    * Wednesday, September 27 : 8:15am (IBIS), 8:20am (Bauhaus)
    * Thursday, September 28 : 8:15am (IBIS), 8:20am (Bauhaus)
  - to leave the MPIA to the IBIS hotel and Bauhaus in Heidelberg as follows :
    * Monday, September 25 : 6:15pm
    * Tuesday, September 26 : 6:15 pm
    * Wednesday, September 27 : 5:30 pm
    * Thursday, September 28 : 6:15 pm

- By Public Transportation

  From Bismarckplatz (city center main plaza), take bus no. 21 direction **"Königstuhl"**. Several tramways leaving from the central train station (Hauptbahnhof) take you to Bismarckplatz. From there bus no. 21 will be leaving every hour on the hour to Königstuhl where MPIA is located, with an additional bus at 8:15am:

  - 7:00am, 8:00am, 8:30am, 9:00am, 10:00am, 11:00am, etc.

  Once you arrive at the bus station **"Sternwarte"**, follow the signs to walk to the Max-Planck Institute.

  Bus no. 21 leaves every hour on half the hour from Königstuhl to Heidelberg as follows:

  - 7:30am, 8:30am, 9:00am,...,12:30am, 1:30pm, 2:30pm, 3:30pm, etc.

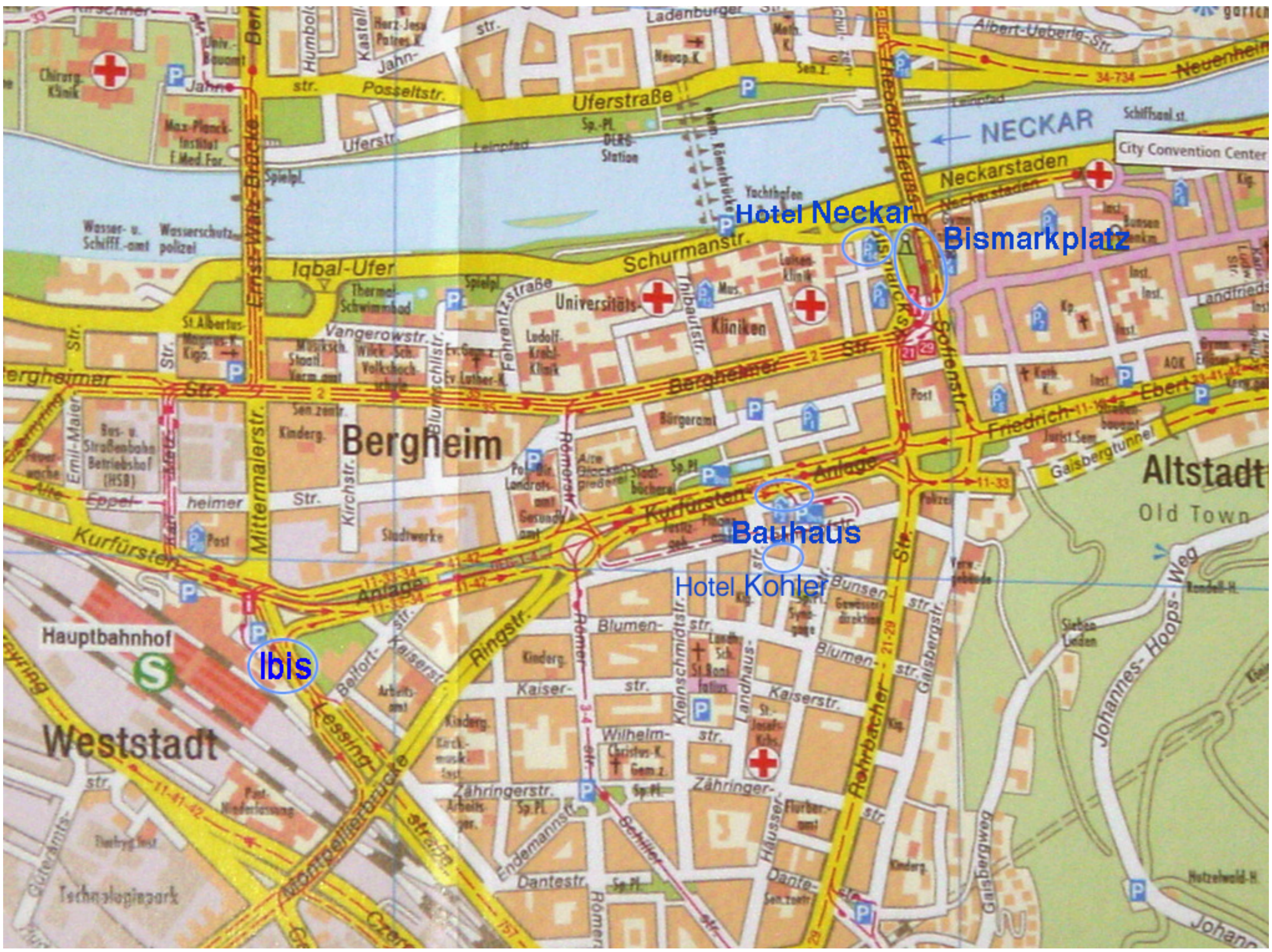
- By Taxi

  Taxis are most likely waiting and available at the Hauptbahnhof, Bismarckplatz, and/or the Hotel Crowne Plaza (where you arrive with the Lufthansa Bus). The fare to MPIA is 16 to 22 Euro. Tel.: (6221) 3 76 76

- By car

  To the Königstuhl and MPIA From Heidelberg:

  - Once at Bismarckplatz, which is considered the centre of town, follow signs direction Schloss (castle).
  - NOTE: The castle is represented by its symbol which is its silhouette. No other notations usually accompany this symbol.
  - Then, follow the signs Königstuhl.
  - At the junction at the top of the hill, please follow the sign Max-Planck-Institut für Astronomie. Turn left.
  - Stay on the main road and follow sign Max-Planck-Institut für Astronomie on the left.
  - After about 100m turn right and follow the access road to the MPIA. The MPIA gate is open on working days from 6:30h to 18:45h.



Conference Dinner - Wednesday, September 27 at 8:00pm

The conference dinner will be held at the **Kulturbrauerei** (http://www.heidelberger-kulturbrauerei.de/), located in the old downtown of Heidelberg.

The address is :

KulturBrauerei
Hotel and Brewery
Leyergasse 6
D-69117 Heidelberg
Phone: +49 6221/502980
Fax: +49 6221/5029879