EP 5: Postersitzung

Time: Tuesday 16:30–18:30 Location: DO24 Foyer

EP 5.1 Tue 16:30 DO24 Foyer

Moving hydrogen in neutron star magnetic fields — •Thorsten Kersting and Günter Wunner — Institut für Theoretische Physik 1, Universität Stuttgart

In recent years, significant improvements in numerical calculations of atoms in neutron star magnetic fields have led to the possibility of producing a huge amount of atomic data, which can serve as a basis for modeling neutron star atmospheres. To calculate the quantity of interest, i.e. the opacity, from cross sections and dipole strengths, it is necessary to consider broadening effects due to effects of the hot plasma in the neutron star atmosphere. The largest broadening effect for atoms in neutron star magnetic fields is the motion of the atoms perpendicular to the magnetic field (motional Stark effect). For hydrogen we calculate the energy shift due to this motional Stark effect. We work in center of mass and relative coordinates and expand the wavefunction in a 2D B-Spline basis. Additionally the cylindrical symmetry is lost and we also have to expand in basis functions with different magnetic quantum numbers.

EP 5.2 Tue 16:30 DO24 Foyer

Helicity of cosmic gamma rays – a new observable for astrophysics — •Stanislav Tashenov[1] and Vladimir A. Yerokhin[2] — [1]Physikalisches Institut der Universität Heidelberg, Germany — [2]Center for Advanced Studies, St. Petersburg State Polytechnical University, Russia

Linear polarization has recently added a new dimension to the gamma-ray astrophysics. Its measurements provide information about geometries, magnetic fields and emission mechanisms of the most energetic sites in the Universe. Circular polarization, or helicity, of cosmic gamma rays, however, still remains a terra incognita. Here we show that the latest developments in the laboratory electron-beam polarimetry pave the way for the helicity detection techniques compatible with the existing orbital telescopes. Armed with these techniques, we should be able to get hold of the helicity of cosmic gamma rays in a not-too-distant future.

EP 5.3 Tue 16:30 DO24 Foyer

Environmental Impact on the Interstellar Medium of Disk Galaxies — •Jan Bolte[1], Elke Roediger[2], Marcus Brüggen[2], and Dieter Breitschwerdt[1] — [1]Zentrum für Astronomie und Astrophysik, TU Berlin, Hardenbergstr. 36, 10623 Berlin, Germany — [2]Hamburger Sternwarte, Universität Hamburg, Gojenbergsweg 112, 21029 Hamburg, Germany

Hydrodynamical simulations of the intercluster medium provide us with the orbit of a disk galaxy through a galaxy cluster. In a zoom-in simulation we study the impact of the time-dependently changing boundary conditions on the interstellar medium of the disk galaxy. In particular, we discuss the resulting star formation rate and the turbulent structure of the interstellar medium and compare the results with simulations with constant boundary conditions.

EP 5.4 Tue 16:30 DO24 Foyer

Solar induced interannual variability of ozone — •Tilo Fytterer, Miriam Sinnhuber, and Gabriele Stiller — Institute for Meteorology and Climate Research, Karlsruhe Institute of Technology, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany

Measurements by the Michelson Interferometer for Passive Atmospheric Sounding instrument on board the ENVIromental SATellite from 2005 - 2011 are used to investigate the impact of solar and geomagnetic activity on O3 in the stratosphere and mesosphere inside the Antarctic polar vortex. Observations of NOy in the Antarctic upper stratosphere/mesosphere and the Ap index have shown a positive correlation. Therefore, a link between high energetic particles, mainly originating from the sun, and the destruction of O3 in the presence of solar radiation due to catalytic chemical reactions with odd nitrogen (N+NO+NO2) and odd hydrogen (H+OH+HO2) is suggested. Thus in this study, correlation analysis between a 26 days average centred at 1 Apr, 1 May and 1 Jun of several solar/geomagnetic indices (Ap, F10.7 cm solar radio flux, Lyman-a, 2 MeV electrons flux) and 26 day running means from 1 Apr - 1 Nov of O3 in the altitude range from 20-70 km were performed. The results reveal negative correlation coefficients propagating downward throughout the polar winter, at least for the Ap index and the 2 MeV electrons flux. Comparisons with Saber and Odin/SMR O3 data are in moderate agreement, also showing a descending negative signal in either indices, but only for the correlation with 1 Apr.

EP 5.5 Tue 16:30 DO24 Foyer

Messung von sekundären Neutronen mit einem Phoswich-Detektor auf der Umweltforschungsstation Schneefernerhaus — •Enno Scharrenberg[1], Stephan Böttcher[1], Sönke Burmeister[1], Esther Miriam Dönsdorf[1], Bernd Heber[1], Vladimir Mares[2] und Werner Rühm[2] — [1]Christian-Albrechts-Universität zu Kiel, Institut für Experimentelle und Angewandte Physik, Extraterrestrische Physik — [2]Helmholtz Zentrum München, German Research Center for Environmental Health (GmbH), Institute of Radiation Protection

Sekundäre Neutronen in der Erdatmosphäre entstehen durch Wechselwirkung der primären Teilchen der galaktischen kosmischen Strahlung mit den Atomkernen der Luft wie zum Beispiel durch Spallation und Kernverdampfungsprozesse. Mit Neutronenmonitoren und Bonner Kugeln werden diese sekundären Neutronen üblicherweise am Erdbogen kontinuierlich gemessen. Mit dem Phoswich Detektor PING (Phoswich Instrument for Neutrons and Gammas) soll eine alternative Möglichkeit zu den vorhandenen Messmethoden vorgestellt werden. Seit Ende November 2013 misst PING dauerhaft an der Umweltforschungsstation Schneefernerhaus auf der Zugspitze (2660 m über Meeresspiegel). Die Funktionsweise des Detektors PING und erste Messergebnisse werden vorgestellt.

EP 5.6 Tue 16:30 DO24 Foyer

The On-Board Data Handling System of the AFIS-P Mission — •Dominic Gaisbauer[1], Daniel Greenwald[1], Alexander Hahn[1], Philipp Hauptmann[1], Igor Konorov[1], Martin Losekamm[1,2], Lingxin Meng[1], Stephan Paul[1], Thomas Pöschl[1], and Dieter Renker[3] — [1]Physics Department E18, Technische Universität München — [2]Institute of Astronautics, Technische Universität München — [3]Physics Department E17, Technische Universität München

The Antiproton Flux in Space experiment (AFIS) is a novel particle detector comprised of silicon photomultipliers and scintillating plastic fibers. Its purpose is to measure the trapped antiproton flux in low Earth orbit. To test the detector and the data acquisition system, a prototype detector will be flown aboard a high altitude research ballon as part of the REXUS/BEXUS program by the German Aerospace Center (DLR). This talk will present the on-board data handling system and the ground support equipment of AFIS-P. It will also highlight the data handling algorithms developed and used for the mission.

This project is supported by DLR and the Cluster of Excellence "Origin and Structure of the Universe".

EP 5.7 Tue 16:30 DO24 Foyer

Dynamical response of middle atmosphere to changed ozone climatology: results from coupled chemistry-climate model (EMAC) — •Khalil Karami, Stefan Versick, and Miriam Sinnhuber — Karlsruhe Institute of Technology- Institute for Meteorology and Climate Research

Knowledge about natural variability of the climate is crucially important to understand the observed climate change. On the other hand, in order to accurately determine the role of anthropogenic activities on climate change, we need to distinguish between contributions of Man-made and natural sources on climate variability. The sun, as a variable star, not only is the source of energy to climate system, but also is one of the most important sources of natural variability of Earth's climate system. In general, climate response to solar variation is divided into two broad categories, directly affecting tropospheric processes (bottom up), or indirectly due to coupling with stratospheric ozone and radiative heating (top-down).The impact of changed ozone values on middle atmospheric dynamics and temperature is the primary goal of the current study. The Chemistry-Climate Model ECHAM/MESSy Atmospheric Chemistry (EMAC), version 2.42, with FUBRad shortwave radiation scheme is used to investigate the impact of changed ozone values on stratospheric temperatures and wind fields. Several

model runs were carried out over a period of 50 years with a free-running version of the model driven by a prescribed ozone climatology differing slightly in the different model runs to investigate the impact of ozone changes in different altitudes and latitude regions.

EP 5.8 Tue 16:30 DO24 Foyer

Solare Variation in NO und NO2 der mittleren Atmosphäre — •Felix Friederich[1], Miriam Sinnhuber[1], Stefan Bender[1], Thomas von Clarmann[1], Bernd Funke[2] und John Burrows[3] — [1]Institut für Meteorologie und Klimaforschung, KIT, Karlsruhe, Deutschland — [2]Instituto de Astrofisica de Analucia, CSIC, Granada, Spanien — [3]Institut für Umweltphysik, Universität Bremen, Bremen, Deutschland

Elektronen aus der Aurora und aus den Strahlungsgürteln präzipitieren abhängig ihrer Energie verschieden tief in die Erdatmosphäre. (Ionen-)chemische Reaktionen, die dadurch ausgelöst werden, können in der Mesosphäre und der oberen Stratosphäre HOx(OH+OH2) und NOx(NO+NO2) erzeugen. Jüngste Studien zeigen eine HOx-Produktion überhalb 52km und eine NO-Produktion überhalb 70km, die auf Elektronenniederschlag zurückzuführen sind.

Die Instrumente SCIAMACHY und MIPAS auf dem Satelliten Envisat haben von 2002-2012 die Erdatmosphäre während eines fast kompletten Sonnenzyklus beobachtet. Der NO-Datensatz von SCIAMACHY (nomineller Modus, 60-90km Höhe) und der NO2-Datensatz von MIPAS (nomineller Modus, 40-60km Höhe) werden auf den Einfluss von solaren und geomagnetischen Veränderungen untersucht und miteinander verglichen. Mit Hilfe der Methode der Superposed Epoch Analysis finden wir in beiden Datensätzen den 27-Tage-Zyklus der Sonnenrotation und eine Abhängigkeit zu geomagnetischen Indizes. Der Einfluss von diesen wird höhen- und längenabhängig präsentiert, wobei auch die Lebenszeit der Gase bestimmt und berücksichtigt wird.

EP 5.9 Tue 16:30 DO24 Foyer

Messung der Winkelverteilung geladener Teilchen in der Atmosphäre — •Dennis Trautwein, Marlon Köberle, Stefan Wraase, Finn Christiansen, Maximilian Brüdern, Sebastian Martensen, Bernd Heber, Robert Wimmer-Schweingruber, Sönke Burmeister und Stephan Böttcher — IEAP, Christian-Albrechts-Universität zu Kiel, Deutschland

Durch die Wechselwirkung der kosmischen Strahlung mit der Atmosphäre entstehen Teilchenschauer aus einer hohen Anzahl von Sekundärteilchen. Ziel unseres Experiments ist die Winkelverteilung von geladenen Teilchen in der Atmosphere zu bestimmen. Wir planen die geladenen Teilchen mit einem Sensorkopf, bestehend aus mehreren Halbleiter-Detektoren, zu messen. Dieser Sensorkopf benötigt einen wohldefinierten geometrischen Aufbau, der eine hinreichende Winkelauflösung zulässt. Trifft ein geladenes Teilchen auf einen der Halbleiter-Detektoren, wird die im Material abgegebene Energie registriert, verstärkt, digitalisiert und zusammen mit dem Zeitpunkt des Aufpralls gespeichert. Über Koinzidenzmessung können wir dann durch den geometrischen Aufbau Rückschlüsse auf den Einfallswinkel ziehen. Das Experiment wird im Rahmen des BEXUS-Programms des DLR mit einem Atmosphärenballon im kommenden Herbst fliegen und Messungen in bis zu 30km Höhe vornehmen. In diesem Poster soll der wissenschaftliche Hintergrund, das Experiment sowie das BEXUS-Programm vorgestellt werden.

EP 5.10 Tue 16:30 DO24 Foyer

SUMER observations of sungrazing comet 2012/S1 during perihelion — •Werner Curdt, Hermann Böhnhardt, Sami Solanki, Luca Teriaca, and Udo Schühle — Max Planck Institute for Solar System Research; Katlenburg-Lindau, Germany

During its recent perihelion passage comet ISON came so close to the Sun that it appeared in the field-of-view of the SUMER spectrometer on SOHO and allowed observations with high spatial and temporal resolution. We report results of spectroscopic observations of the comet during its encounter with the Sun. Our data show the dust tail behind the predicted position of the nucleus in Lyman-alpha emission, seen as light from the solar disk scattered at fine dust particles. The tail is offset from the trajectory and not aligned with it. We model the dust emission and dynamic to reproduce the appearance of the tail. We could not find any signature of activity around the expected position of the nucleus and conclude that the outgassing processes must have stopped before the comet entered our FOV. After observing 18 years mostly solar targets, this was the first time that SUMER completed spectroscopic observations of a comet.

EP 5.11 Tue 16:30 DO24 Foyer

Separation der Helium Isotope mit dem Electron Proton Helium Instrument (EPHIN) an Bord der Raumsonde SOHO — •Cedric Berndt[1], Patrick Kühl[1], Bernd Heber[1], Raúl Gomez-Herrero[2], Nina Dresing[1] und Andreas Klassen[1] — [1]Institut für Experimentelle und Angewandte Physik, CAU Kiel — [2]Universidad de Alcalá

An Bord der Raumsonde SOHO (Solar and Heliospheric Observatory) misst das Electron Proton Helium Instrument (EPHIN) Elektronen im Energiebereich von 0.3 MeV bis oberhalb von 10 MeV und Wasserstoff sowie Helium im Energiebereich von 4 MeV/Nukleon bis oberhalb von 50 MeV/Nukleon. Das Instrument besteht aus 5 Silizium Halbleiterdetektoren in Teleskop Geometrie und erlaubt die Isotopentrennung der gemessenen Ionen. Solare energiereiche Teilchenereignisse werden anhand der Heliumisotope in impulsive oder graduale Ereignisse eingeteilt. Dabei werden Häufigkeiten der Verhältnisse zwischen ^{3}He und ^{4}He von 10^{-4} (gradual) bis nahezu 1 (impulsiv) beobachtet. In diesem Beitrag stellen wir ein Verfahren vor, dass basierend auf der dE/dx-E-Methode eine möglichst genaue Bestimmung des Isotopenverhältnisses ermöglicht und zeigen exemplarisch das 3He zu 4He Verhältnis für die galaktische kosmische Hintergrundstrahlung und einige ausgewählte Ereignisse.

EP 5.12 Tue 16:30 DO24 Foyer

The Current Status of Model Development of the Electron and Proton Telescope for Solar Orbiter — •Jan Steinhagen, S.R. Kulkarni, Jan Tammen, Sebastian Boden, Robert Elftmann, César Martin, Ali Ravanbakhsh, Stephan I. Böttcher, Lars Seimetz, Björn Schuster, and Robert Wimmer-Schweingruber — Institute for Experimental and Applied Physics, University of Kiel

ESA's Solar Orbiter mission, scheduled for launch in January 2017, will study how the sun creates the inner heliosphere. Therefore, the spacecraft will perform in situ and remote sensing measurements of the sun on a high inclination orbit with a perihelion of about 60 solar radii, making it possible to observe the poles of the sun from nearby. The Energetic Particle Detector suite on-board of Solar Orbiter will measure particles of a wide energy range and from multiple directions. One of the important sensors of the EPD suite is the Electron Proton Telescope. It consists of two antiparallel telescopes with two silicon detectors respectively and is designed to detect electrons between 20 - 400 keV and protons from 20 keV to 7 MeV. EPT relies on a magnet/foil technique to discriminate between electrons and protons. Here, we present the testing of the Structural and Thermal Model, which has already been delivered to ASTRIUM for spacecraft level tests as well as the integration and testing of the Engineering Model, which already provides full electrical functionality.

EP 5.13 Tue 16:30 DO24 Foyer

SEPServer SEP Event Catalogue in and out of the Ecliptic; a Ulysses and L1 Particle Data Driven Study — •B. Heber[1], N. Agueda[2], D. Heyndrickx[3], K. Klein[4], O. Malandraki[5], A. Papaioannou[5], B. Sanahuia[2], and R. Vainio[6] — [1]Insititut für Experimentelle und Angewandte Physik, Christian-Albrechts-Universität zu Kiel — [2]Departament d'Astronomia i Meteorologia, Universitat de Barcelona — [3]DH Consultancy BVBA, Leuven — [4]LESIA*Observatoire de Paris, CNRS, UPMC Univ Paris — [5]National Observatory of Athens — [6]University of Helsinki

SEPServer is a three year collaborative project funded by the seventh framework programme of the European Union. The objective of the project is to provide, among other things, access to state-of-the-art observations and analysis tools for the scientific community on solar energetic particle (SEP) events. The Ulysses mission, launched in 1990, explored the three dimensional heliosphere during different solar activity conditions until the spacecraft was finally switched off on June 30, 2009. The mission has been the only one that allowed us to study the characteristics of SEPs at low and high latitudes. In this work, the Cosmic Ray and Solar Particle Investigation (COSPIN) Kiel Electron Telescope (KET) data of 38 to 125 MeV has been used to identify a number of 40 events SEPs observed in and out of the ecliptic plane over solar cycle 23. The event catalogue presented in this paper will be available to the community for further analysis through http://server.sepserver.eu.

EP 5.14 Tue 16:30 DO24 Foyer

Modeling the Electron-Proton Telescope on Solar Orbiter — •Sebastian Boden, Jan Steinhagen, S.R. Kulkarni, Jan Tammen, Robert Elftmann, César Martin, Ali Ravanbaksh, Stephan

Böttcher, Lars Seimetz, and Robert F. Wimmer-Schweingruber — Christian-Albrechts-Universität, Kiel

The Electron Proton Telescope (EPT) is one of four sensors in the Energetic Particle Detector suite for Solar Orbiter. It investigates low energy electrons and protons of solar events in an energy range from 20 - 400 keV for electrons and 20 keV - 7 MeV for protons. It distinguishes electrons from protons using a magnet/foil technique with silicon detectors. There will be two EPT units, each with double-barreled telescopes, one looking sunwards/antisunwards and the other north/south.

We set up a Monte Carlo model of EPT using the GEANT4 framework, which we can use to simulate interactions of energetic particles in the sensor. Here we will present simulation results of the energy coverage for different ion species and we will study how it will be possible to distinguish between them.

EP 5.15 Tue 16:30 DO24 Foyer

Near-realtime Cosmic Ray measurements for space weather applications — •Christian Steigies — Christian-Albrechts-Universität zu Kiel, Germany

In its FP7 program the European Commission has funded the creation of scientific databases. One successful project is the Neutron Monitor database NMDB which provides near-realtime access to ground-based Neutron Monitor measurements. In its beginning NMDB hosted only data from European and Asian participants, but it has recently grown to also include data from North American stations. We are currently working on providing also data from stations in Australia, South Africa, and Tibet. With the increased coverage of stations the accuracy of the NMDB applications to issue an alert of a ground level enhancement (GLE) or to predict the arrival of a coronal mass ejection (CME) is constantly improving. Besides the Cosmic Ray community and Airlines, that want to calculate radiation doses on flight routes, NMDB has also attracted users from outside the core field, for example hydrologists who compare local Neutron measurements with data from NMDB to determine soil humidity. By providing access to data from 50 stations, NMDB includes already data from the majority of the currently operating stations. However, in the future we want to include data from the few remaining stations, as well as historical data from stations that have been shut down.

EP 5.16 Tue 16:30 DO24 Foyer

Usage of the force field approach and its limitation - a statistical survey — •Jan Gieseler, Bernd Heber, and Konstantin Herbst — IEAP, CAU Kiel, Deutschland

Galactic cosmic rays (GCRs) are modulated by various effects as they propagate through the heliosphere before they can be detected at Earth. The Parker equation describes this transport. It calculates the phase space distribution of GCRs depending on the main modulation processes: convection, drifts, diffusion and adiabatic energy changes. The force field approximation is a simplification of this equation, reducing it to a one-parameter dependency, the force field potential. This approach is commonly used in many fields. Here, we investigate carefully its constraints by comparing spacecraft GCR measurements at different energies for the last four solar cycles with corresponding force field approximations.

EP 5.17 Tue 16:30 DO24 Foyer

The First Ground Level Event of Solar Cycle 24 and its longitudinal distribution in the inner heliosphere** — •B. Heber[1], N. Dresing[1], W. Dröge[2], R. Goméz-Herrero[3], K. Herbst[1], Y. Kartavykh[2], A. Klassen[1], J. Labrenz[1], O. Malandraki[4], and R. Müller-Mellin[1] — [1]Christian-Albrechts-Universität, Kiel, Germany — [2]2Universität Würzburg, Germany — [3]SRG, University of Alcalá, 28871, Alcalá de Henares, Spain — [4]3National Observatory of Athens, Greece

Ground level events (GLEs) are the most energetic solar particle events (SEPs) that are detected not only by space born instrumentation but also by ground*based instruments like e.g. neutron monitors. On May 17 2012 at 01:25 UT a M5.1 X-ray flare from the active region 1476 (N07, W88) was detected. The event was accompanied by a type III radio burst starting at 1.30 UT and a coronal mass ejection heading towards Stereo A. The corresponding shock wave passed STEREO A on May 18 at 12:43 UT but missed the Earth. The event onsets of near relativistic electrons have been detected at 06:05 UT, 03:38 UT, and 01:51 UT aboard STEREO A and B (125-335 keV) and at SOHO (250-700 keV), respectively. In contrast to observations close to the Earth no strong anisotropies have been observed at both STEREO A and B. The neutron monitor network recorded the first GLE for solar cycle 24. Data observed close to and at Earth will be presented and the longitudinal structure of the event in the inner heliosphere will be discussed.

EP 5.18 Tue 16:30 DO24 Foyer

Modellierung des MeV-Elektronentransportes unter dem Einfluss Korotierender Wechselwirkungsregionen — •Adrian Vogt[1], Frederick Effenberger[2], Horst Fichtner[2], Bernd Heber[1], Jens Kleimann[2], Andreas Kopp[1,2], Marius Potgieter[3] und Oliver Sternal[4] — [1]IEAP Universität Kiel, Germany — [2]Ruhr Universität Bochum — [3]North West Universtiy Potchefstroom, South Africa — [4]Mint Kolleg Baden Württemberg

Seit den 1970er Jahren ist bekannnt, dass Jupiter eine quasi-kontinuierliche Quelle von MeV-Elektronen ist,die den Elektronenfluss in der inneren Heliossphäre dominieren. Dies ermöglicht, den Transport von Elektronen im heliosphärischen Magnetfeld zu untersuchen, indem man den Einfluss von Korotierenden Wechselwirkungsregionen (CIRs) betrachtet. CIRs sind periodische Strukturen im Sonnenwind, die durch einen sprunghaften Anstieg der Geschwindigkeit und eine Verdichtung der Magnetfeldes charakterisiert werden. Um diese veränderten Bedingungen und ihren Einfluss auf den Fluss der Jupiterelektronen zu untersuchen, wurde der VLUGR3-Code verwendet, um die Parker-Transportgleichung zu lösen. Dafür wurden zwei verschiedene Ansätze genutzt, das Modell von Kissmann [2002] und ein weiteres von Giacalone [2002], das zu diesem Zweck weiterentwickelt und den Messdaten von STEREO sowie ACE angepasst wurde. Die Simulationsergebnisse wurden mit den Elektronenzählraten der IMP-8-Mission verglichen, um die Unterschiede zwischen den beiden Modellen zu untersuchen. Dabei zeigt sich eine realistischere Beschreibung des Zeitprofiles durch das neue Giacalone-Modell.

EP 5.19 Tue 16:30 DO24 Foyer

Studying the near-Sun dust environment with Solar Probe Plus — •Jens Rodmann[1], Volker Bothmer[1], Russ A. Howard[2], Arnaud Thernisien[2], Malte Venzmer[1], and Angelos Vourlidas[2] — [1]Institut für Astrophysik, Universität Göttingen, Deutschland — [2]Naval Research Laboratory, Washington, D.C., USA

Solar Probe Plus will be a ground-breaking mission to explore the innermost regions of the solar system. By flying down to ∼10 solar radii (∼0.05 AU), the mission will revolutionize our knowledge of the Near-Sun dust environment. This region is governed by a poorly understood interplay of dust delivery by sungrazing comets and radiation forces, the destruction of dust by sublimation, and interactions of dust particles with the ambient coronal plasma.

We will present the Solar Probe Plus mission and its scientific payload. Emphasis will be on two instruments that are directly relevant for dust-related science: (1) the Wide-field Imager for SolarPRobe (WISPR), a white-light heliospheric imager dedicated to study the solar wind, coronal mass ejections, and dust-plasma interactions; (2) the FIELDS Experiment for electric and magnetic field measurements in the solar wind, that can also detect telltale voltage signatures of dust-particle impacts on the spacecraft.

We will highlight simulations of the scattered-light emission from dust particles (F-corona) in order to assess the capabilities of the WISPR instrument to image the dust-free zone around the Sun. We will test whether dust density enhancements as predicted by dynamical simulations (e.g. Kobayashi et al. 2009) can be identified and resolved.

EP 5.20 Tue 16:30 DO24 Foyer

Comet ISON - from cradle to grave: The approach phase — •Jessica Agarwal[1], Hermann Boehnhardt[1], Dietmar Germerott[1], Ulrich Hopp[2], Bernd Inhester[1], Luisa Lara[3], Nilda Oklay[1], Borut Podlipnik[1], Christoph Ries[2], Michael Schmidt[2], Udo Schühle[1], Colin Snodgrass[1], Sami Solanki[1], Bringfried Stecklum[4], Luca Teriaca[1], Cecilia Tubiana[1], and Jean-Baptiste Vincent[1] — [1]Max-Planck Institut für Sonnensystemforschung — [2]Universitätssternwarte München — [3]Instituto de Astrofísica de Andalucía — [4]Thüringer Landessternwarte Tautenburg

Comet ISON came from the Oort Cloud (10000 - 100000 AU), the outermost region of the Solar System, where the debris from the formation of giant planets and possible extra-solar comets are stored since the early days of the Sun's existence. The overall chemistry of the comet appears to be normal suggesting a solar origin. During approach to the Sun it was active at least since it passed 9.4AU displaying enhanced

activity most likely driven by CO2 and CO ice sublimation. From about 2.5 AU inwards water ice sublimation dominated the activity of the km size nucleus producing a gas and dust coma of 100000 km extension and a several Million km long plasma and dust tails most of which were seen overlapping from Earth.

EP 5.21 Tue 16:30 DO24 Foyer

Comet ISON - from cradle to grave: The perihelion passage — •Jessica Agarwal[1], Hermann Boehnhardt[1], Dietmar Germerott[1], Ulrich Hopp[2], Bernd Inhester[1], Luisa Lara[3], Nilda Oklay[1], Borut Podlipnik[1], Christoph Ries[2], Michael Schmidt[2], Udo Schühle[1], Colin Snodgrass[1], Sami Solanki[1], Bringfried Stecklum[4], Luca Teriaca[1], Cecilia Tubiana[1], and Jean-Baptiste Vincent[1] — [1]Max-Planck Institut für Sonnensystemforschung — [2]Universitätssternwarte München — [3]Instituto de Astrofísica de Andalucía — [4]Thüringer Landessternwarte Tautenburg

Comet ISON came from the Oort Cloud (10000 - 100000 AU), the outermost region of the Solar System, where the debris from the formation of giant planets and possible extra-solar comets is stored since the early days of the Sun existence. The comet approached the Sun within 0.012AU on 28 Nov. 2013. The fatal disintegration of the nucleus occurred close to the Sun in two steps: About 1.5 days before perihelion, an explosion of the nucleus produced an armada of fragments that continued on the track of the comet with fading activity. The subnuclei exhausted their icy fuel shortly before reaching perihelion and dissolved in a cloud of dust. This cloud and some solid material from the nucleus explosion escaped the Sun and witness the death of the nucleus of comet ISON.

EP 5.22 Tue 16:30 DO24 Foyer

Rosetta/OSIRIS observations of the dust coma of comet 67P/Churyumov-Gerasimenko — •Jessica Agarwal, Jean-Baptiste Vincent, and Holger Sierks — Max-Planck-Institut für Sonnensystemforschung, Göttingen, Germany

We present our planned observations and analyses of the dust coma of comet 67P/Churyumov-Gerasimenko with the OSIRIS camera system on board the Rosetta spacecraft. Comet 67P/Churyumov-Gerasimenko is the main target of the European Space Agency's Rosetta mission, which will reach the comet in the course of 2014, deploy a lander on its surface and follow the comet on its path towards perihelion. The Optical, Spectrocopic and Infrared Remote Imaging System (OSIRIS) on the Rosetta orbiter will take high-resolution images in multiple wavelength bands from the UV to the near-IR, which will show the nucleus surface and the near-nucleus coma in unprecedented detail. The coma images will allow us to study the activity distribution on the surface, and give us constraints for quantitative models of the comet's dust production. We present our expected data, the scientific questions we want to address, and the envisaged strategies for data analysis.

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New Horizons Vorbeiflug: Massenbestimmung von Pluto und Charon — •Martin Pätzold[1], Tom Andert[2], Len Tyler[3], Michael K. Bird[1], David P. Hinson[3] und Ivan Linscott[3] — [1]RIU-Planetenforschung an der Universität zu Köln, Köln — [2]Universität der Bundeswehr München, Neubiberg — [3]Stanford University, Stanford, California, USA

Die Raumsonde New Horizons wird am 14.Juli 2015 als erste Raumsonde durch das Pluto-System fliegen und dabei Pluto und Charon in einem Abstand von 10.000 km bzw. 20.000 passieren. Eine der Aufgaben des REX Radio Science Experimentes an Bord von New Horizons ist die direkte und präzise Bestimmung der (Einzel-)Massen von Pluto und seines großen Mondes Charon über die Dopplerverschiebung des Radiosignals der Raumsonde. Unüblicherweise für Radio Science Experimente werden zwei unterschiedliche Radioverbindungen während des Vorbeifluges eingesetzt. Die Radiomessungen beginnen bereits eine Woche vor dem Vorbeiflug und werden für weitere vier Tage nach dem Vorbeiflug weitergeführt. Vorgestellt werden die Planungen für den Vorbeiflug, die Datentypen, sowie Abschätzungen über die Genauigkeit der Massenbestimmung. Der größte Beitrag zum Fehler der Massenbestimmung wird dabei die Ungenauigkeit der Kenntnis der Vorbeiflugsentfernung (oder allgemein die Pluto Ephemeride) sein.

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The Dust Impact Monitor (DIM) on-board the Rosetta lander Philae — •Thomas Albin[1], Harald Krueger[1], Alexander Loose[1], and Alberto Flandes[2] — [1]Max-Planck-Institut für Sonnensystemforschung, 37077 Göttingen, Germany — [2]Ciencias Espaciales, Instituto de Geofisica, UNAM, 04510 Mexico, D.F.

The Dust Impact Monitor (DIM) is a dust and ice measuring instrument mounted on top of the Rosetta lander Philae. Rosetta is an ESA mission to comet 67P/Churyumov-Gerasimenko that shall encounter the comet in summer 2014. Philae shall land on the comet nucleus in November 2014.

DIM is a cube-shaped instrument with 9 piezoelectric sensor plates mounted on 3 orthogonal sides of the cube. Impacts of ice and dust particles onto the sensor plates lead to deformation of these plates that cause a voltage signal which can be measured. On the comet, active regions emit dust particles of different sizes, shapes, velocities and directions. With DIM one can determine the properties of these particles by comparing the amplitude and contact time of the impact events with Hertzian theory of elastic impact. This will reveal the physical characteristics of the cometary ice and dust in the size range of a few 100 Micrometers to a few Millimeters.

We present laboratory measurements performed with a flight-spare unit of the DIM sensor. We performed impact experiments with spherical ice particles and with balls of other materials to simulate impacts of cometary grains onto the sensor. Our results are mostly consistent with Hertz' theory of elastic impact.

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The prediction of stellar atmospheric oscillations as a result of propagating magnetic tube waves — •Diaa Fawzy[1] and Zdzislaw Musielak[2] — [1]Izmir University of Economics, Izmir, Turkey — [2]Physics dept., University of Texas at Arlington, USA

In the current study we theoretically predict atmospheric oscillations in a thin and non-isothermal magnetic flux tube embedded in magnetic-free atmospheres of late-type stars. Our models are based on self-consistent, nonlinear and time-dependent numerical computations. Longitudinal tube waves are considered and the wave energy spectra and fluxes generated in convective zones of these stars are calculated. The process of filtering the energy carried by longitudinal tube waves is investigated and both the local heating by shock waves as well as the excitation of atmospheric oscillations are studied. Frequencies of the resulting atmospheric oscillations are computed numerically at different atmospheric heights in stars of different effective temperatures and gravities, and compared to three analytically obtained cutoff frequencies. The obtained results show that the oscillation frequency ranges from 4 mHz for F5V stars to 20 mHz for M0V stars. It is pointed out that this frequency range may be relevant to the recent stellar p-mode observations made by the NASA space mission Kepler.