

Press release

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Further great successes for Bern's planetary research

Today, the European Space Agency (ESA) has given the green light for the industrial implementation of the CHEOPS mission which is being led by the University of Bern. In addition, ESA selected today the «PLATO» M-class mission in which the University of Bern is also heavily involved. Hardly a month after the National Center of Competence in Research (NCCR) «PlanetS» has been selected by the Swiss Federal Council, these decisions confirm the leading position of Bern's space and planetary research.

«Reaching three major milestones in about two months is really exciting. It demonstrates the leading position in planetary sciences of Bern and Switzerland as well as of Swiss industry,» says Prof. Willy Benz from the Center for Space and Habitability (CSH) and Director of the Physics Institute of the University of Bern, clearly delighted. Astrophysicist Benz is leading the space project «CHEOPS» (CHaracterizing ExOPlanet Satellite) for Switzerland, which was given the definitive «go ahead» (called «adoption» in the technical jargon) for the industrial realisation by ESA today. He and his team from the CSH in Bern also have a significant involvement in the «PLATO» (PLANetary Transits and Oscillations of stars) project which was selected as the next «M class» mission by the delegates from the 19 ESA member states at their meeting today in Paris. Thirdly, along with co-leader Prof. Stéphane Udry, Director of the Department for Astronomy at the University of Geneva, he is also leading the new National Center of Competence in Research (NCCR) «PlanetS» which was chosen by the Swiss Federal Council last December along with seven other NCCRs.

Hunting for planets which could support life

These three large projects are closely linked to one another. «CHEOPS» and «PLATO» are satellite missions and deliver data; «PlanetS» coordinates the scientific work of researchers, which analyze the data from space missions. At the end of 2017, the «CHEOPS» space telescope will be put into an orbit up to 800 kilometres above Earth. Over a period of three and a half years, it will investigate 700 carefully chosen bright stars outside of our solar system already known to host planets using the so-called transit method. As a result, «CHEOPS» will detect planets transiting these stars and measure their diameter. The measurement by CHEOPS coupled with the determination of the mass of these planets by radial velocity measurements will provide information about the nature and composition of these planets. These precise radial velocity measurements needed are another Swiss speciality. The detector «HARPS», located at a 3.6 meter telescope in Chile and developed under the leadership of the University of Geneva, is probably the most successful instrument today.

With the green light by ESA, industrial partners for the realisation of CHEOPS are now being sought. The telescope will be assembled, tested and calibrated by CSH at the University of Bern. The structure of the telescope (the tube) and all the mounting elements, will be provided by Swiss industry and the rest of the components will come from partner institutes in Europe. The platform carrying the 33cm telescope will be built in either Spain or England. Once assembled, the entire satellite will weigh about 250 kg and will undergo a number of tests at RUAG Space in Switzerland.

Launched in 2024, the satellite «PLATO» with 34 telescopes will replace «CHEOPS» and observe bright stars and their planets. However, unlike «CHEOPS», it will not characterise known planets but will roam large areas of sky and discover and investigate previously unknown exoplanets and bright stars. Unlike other missions, «CHEOPS» and «PLATO» were designed in such a way that they are able to discover planets which have both a diameter similar to that of the earth and a much longer orbit time around bright stars. Bright stars are necessary for a more in-depth investigation and a longer orbit time indicates a larger distance from the star which means an environment more conducive to have liquid water and therefore more hospitable for life.

Thanks to the new NCCR «PlanetS», researchers in Switzerland will be able to evaluate the data from «CHEOPS» and prepare for «PLATO» in the best possible way. The project which is being co-run by the University of Bern and the University of Geneva aims at expanding Swiss planetary research. After the discovery of numerous exoplanets in recent years, the goal now is to determine their physical and chemical properties. In order to do this, the researchers will use astronomical

observations, data from space missions, laboratory measurements and theoretical modelling. This should enable a better understanding of how planetary systems form and develop. In particular, the general question of how common our solar system is and in particular the Earth and its ability to sustain life, is one of the driver behind these activities. «Today, the search for planets on which life could exist has become a key topic in modern astronomy,» says Willy Benz, «and the University of Bern plays a significant role in it.»

More information: <http://www.cheops.unibe.ch> / <http://www.csh.unibe.ch>

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Caption: PLATO consists of 34 telescopes with their respective detectors. The «blue screen» on the right shows how they will be aligned: The clear blue part in the center indicates the point where all telescopes can point to, while the darker blue parts show where 16 or only 8 will point. This allows a better search in the respective sky section. Picture: PLATO mission.