quires that common properties in all the dSphs be identified – we must therefore carry out similar studies of all dSphs.

Finally, in the area of dynamical modelling, identifying correlations between the kinematics and abundances of the stellar populations in dSphs (e.g. Tolstoy et al. 2006) is likely to provide important new information about the formation and evolution of these objects, which in turn will further constrain models of any astrophysical feedback on their dark matter.

Acknowledgements

Mark I. Wilkinson acknowledges the Particle Physics and Astronomy Research Council of the United Kingdom for financial support. Andreas Koch and Eva K. Grebel thank the Swiss National Science Foundation for financial support.

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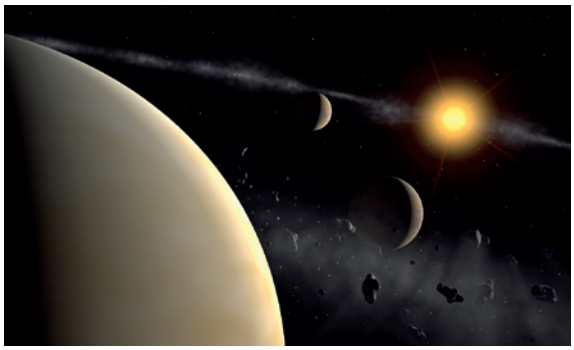
A Three-Planet Extrasolar System

Using the ultra-precise HARPS spectrograph on ESO's 3.6-m telescope at La Silla, a team of astronomers[1] has discovered that a nearby star is host to three Neptune-mass planets. The innermost planet is most probably rocky, while the outermost is the first known Neptune-mass planet to reside in the habitable zone. This unique system is likely further enriched by an asteroid belt.

Over more than two years, the team carefully studied HD 69830, a rather inconspicuous nearby star slightly less massive than the Sun. Located 41 light years away towards the constellation of Puppis, it is, with a visual magnitude of 5.95, just visible with the unaided eye. The team's precise radial-velocity measurements allowed them to discover the presence of three tiny companions orbiting their parent star with periods of 8.67, 31.6 and 197 days.



Planetary System around HD 69830 (Artist's Impression).

"Only ESO's HARPS instrument installed at the La Silla Observatory, Chile, made it possible to uncover these planets", said Michel Mayor, from Geneva Observatory, and HARPS Principal Investigator. "Without any doubt, it is presently the world's most precise planet-hunting machine."

The detected velocity variations are between two and three metres per second. Such small signals could not have been distinguished from noise by most of today's available spectrographs.

The newly found planets have minimum masses between 10 and 18 times the mass of the Earth. Extensive theoretical simulations favour an essentially rocky composition for the inner planet, and a rocky/gas structure for the middle one. The outer planet has probably accreted some ice during its formation, and is likely to be made of a rocky/icy core surrounded by a quite massive envelope. Further calculations have also shown that the system is in a dynamically stable configuration.

The outer planet also appears to be located near the inner edge of the habitable zone, where liquid water can exist at the surface of rocky/icy bodies. Although this planet is probably not Earth-like due to its heavy mass, its discovery opens the way to exciting perspectives.

With three roughly equal-mass planets, one being in the habitable zone, and a possible asteroid belt, this planetary system shares many properties with our own Solar System.

(Based on ESO Press Release 18/06)

[1] Lovis et al. 2006, Nature 441, 305. The team is composed of Christophe Lovis, Michel Mayor, Francesco Pepe, Didier Queloz, and Stéphane Udry (Observatoire de l'Université de Genève, Switzerland), Nuno C. Santos (Observatoire de l'Université de Genève, Switzerland, Centro de Astronomia e Astrofisica da Universidade de Lisboa and Centro de Geofisica de Evora, Portugal), Yann Alibert, Willy Benz, Christoph Mordasini (Physikalisches Institut der Universität Bern, Switzerland), François Bouchy (Observatoire de Haute-Provence and IAP, France), Alexandre C. M. Correia (Universidade de Aveiro, Portugal), Jacques Laskar (IMCCE-CNRS, Paris, France), Jean-Loup Bertaux (Service d'Aéronomie du CNRS, France), and Jean-Pierre Sivan (Laboratoire d'Astrophysique de Marseille, France).