ESOcast Episode 11: 32 New Exoplanets Found — Exoplanets galore delivered by ESO's HARPS		
00:00 [Visual starts] [Narrator] 00:03 1. Today, at an international exoplanet conference, the team who built the High Accuracy Radial Velocity Planet Searcher, better known as HARPS, the spectrograph for ESO's 3.6-metre telescope, reports on the incredible discovery of more than 30 new exoplanets, cementing HARPS's position as the world's foremost exoplanet hunter.		New exoplanet animation...
00:29 ESOcast intro This is the ESOcast! Cutting-edge science and life behind the scenes of ESO, the European Southern Observatory. Exploring the Universe's ultimate frontier with our host Dr J, a.k.a. Dr Joe Liske.		
00:46 [Dr. J] 2. Hello and welcome to the ESOcast. In this episode, we have another major exoplanet discovery coming to you from ESO's La Silla Observatory. And we're not just talking about one exoplanet, we're talking about no less than 30! It's exoplanets galore!		
01:02 [Narrator] 3. Including these new results, data from HARPS have led to the discovery of more than 75 exoplanets in 30 different planetary systems. In particular, thanks to its amazing precision, the search for small planets, those with a mass of a few times that of the Earth — known as super-Earths and Neptune-like planets — has been given a dramatic boost. HARPS has facilitated the discovery of 24 of the 28 planets known with masses below 20 Earth masses. As with the previously detected super-Earths, most of the new low-mass candidates reside in multi-planet systems, with up to five planets per system.		Exoplanets animations... Including systems of planets... e.g trio of Neptunes, Gliese 581 Footage 3.6-metre

In 1999, ESO launched a call for opportunities to build a high resolution, extremely precise spectrograph for the ESO 3.6-metre telescope at La Silla, Chile. Michel Mayor, from the Geneva Observatory, led a consortium to build HARPS, which was installed in 2003 and was soon able to measure the back-and-forward motions of stars by detecting small changes in a star's radial velocity — as small as 3.5 km/hour, or a steady walking pace. Such a precision is crucial for the discovery of exoplanets. The radial velocity method, which detects small changes in the radial velocity of a star as it wobbles slightly under the gentle gravitational pull from an unseen exoplanet, has been most prolific method in the search for exoplanets.		Introduction Michel Mayor Footage HARPS Animation radial velocity
02:36 [Dr. J] 4. In return for building the instrument, the HARPS consortium was awarded 100 observing nights per year over a five-year period. Now this time was used to carry out one of the most ambitious systematic searches for exoplanets so far implemented worldwide by measuring the radial velocities of hundreds of stars that might harbour planetary systems.		On screen: Mayor's team footage in Geneva
02:57 [Narrator] 5. The programme soon proved very successful. Using HARPS, Mayor's team discovered — among others — the first super-Earth around Mu Ara; the trio of Neptunes around HD 69830; Gliese 581d, the first extrasolar planet in the habitable zone of a small star; and the lightest exoplanet ever detected around a normal star, Gliese 581e. More recently, they found a potentially lava-covered world, with density similar to that of the Earths'.		Artist impression of trio of Neptunes the Gliese 581d Gliese 581e Corot-7b
03:32 [Dr J.] 6. These observations have given astronomers great insight into the diversity of planetary systems and they have helped us to understand how they might form.		Animation of planet formation Animation of super-earth planets
03:41 [Narrator] 7. The HARPS consortium was very careful in their selection of targets, with several sub-programmes aimed at looking for planets around solar-like stars, low-mass dwarf stars, or stars with a lower metal content than the Sun. Although it was thought that giant planets couldn't form around low-mass stars, the HARPS team has found several of them. The number of exoplanets known around low-mass stars — so-called M dwarfs — has also dramatically increased, including new		Gliese 581

super-Earth candidates.		
04:15 [Dr. J] 8. Although the first phase of the observing programme is now officially concluded, two new programmes have been started. And the team still expects to make many new discoveries from the first 5 years of data. There is no doubt that HARPS will continue to lead the field of exoplanet discovery, and especially pushing towards the detection of Earth-type planets. This is Dr J signing off for the ESOcast. Join me again next time for another cosmic adventure.		On screen: New animation.
04:41 [Outro]		ESOcast is produced by ESO, the European Southern Observatory. *ESO, the European Southern Observatory, is the pre-eminent intergovernmental science and technology organisation in astronomy designing, constructing and operating the world's most advanced ground-based telescopes.*

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