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Video Podcast **Episode 8: A step closer to our origin…** **FOR IMMEDIATE RELEASE 18:00 (CET)/12:00 AM EST 06 September, 2007**		
00:00 **[Visual starts]** **[Narrator]** **00:00** By scrutinising the Hubble Ultra Deep field – the deepest image of the sky ever made – the NASA/ESA Hubble Space Telescope and the NASA Spitzer Space Telescope have joined forces to discover nine of the smallest, faintest, most compact galaxies ever observed in the distant Universe. **00:19** **00:35** **[Woman]** This is the Hubblecast! News and Images from the NASA/ESA Hubble Space Telescope. Travelling through time and space with our host Doctor J a.k.a. Dr. Joe Liske. **00:48** **[Dr. J]** Welcome to the Hubblecast! One of the most fundamental questions that we all ask – astronomers and laypersons alike – is: where do we come from? We, the Earth, the Sun and the rest of the Solar System, are all part of the Milky Way Galaxy, and so the question of our origin is closely linked to the birth and evolution of the galaxies. Now, the Spitzer and Hubble Space Telescopes have joined forces to discover nine of the faintest, youngest and most compact galaxies ever observed in the distant Universe.		Pan on the HUDF, zoom on the galaxy building blocks + 3D galaxy Image explosion Hubblecast Logo + web site Presented by ESA and NASA TITLE Slide: Episode 8: A step closer to our origin… Virtual studio: Dr J on camera Nametag

01:24 **[Narrator]** Conventional theories for galaxy evolution predict that small galaxies in the early Universe evolved into the massive galaxies of today by merging together. The newly found young galaxies offer important new insights into the Universe's formative years, just one billion years after the Big Bang. Hubble has detected sapphire blue stars residing within the nine pristine galaxies. **[music]**		Building blocks merge together -> Spiral galaxy 3D Zoom on HUDF + small galaxies
01:48 **[Dr. J]** Although they are glowing with the light of millions of stars, each of the newly discovered galaxies is actually a hundred to a thousand times fainter than our Milky Way. Usually, smaller things in space tend to be less interesting to astronomers than the large ones, but in this case it is the opposite. Three of the new galaxies appear to be slightly disrupted – instead of being shaped like rounded blobs, they appear stretched into tadpole-like shapes. This is a sign that they may be interacting and merging with neighbouring galaxies to form larger, cohesive structures, just as predicted by theory.		Virtual studio: Dr J on camera Disrupted small galaxies (3, 4, 5)
02:29 **[Narrator]** The galaxies were observed in the Hubble Ultra Deep Field (HUDF) with Hubble's Advanced Camera for Surveys and the Near Infrared Camera and Multi-Object Spectrometer as well as Spitzer's Infrared Array Camera and the European Southern Observatory's Infrared Spectrometer and Array Camera.		Hubble/Spitzer/VLT full screen
02:48 **[Dr. J]** In today's Hubblecast we have a special guest, Dr. Martin Kümmel, from the European Hubble group in Munich. Welcome Martin.		Nametag Martin Kümmel
02:55 **[Martin Kümmel]** Hello Dr. J!		
02:57 **[Dr. J]** You and your colleagues are responsible for the particular instrument mode on Hubble that was used by the scientists. Can you tell us a bit about this?		
03:05 **[Martin Kümmel]** Well, the so-called Grism mode in the Advanced Camera for Surveys spreads the different colours emitted by the galaxies into short "trails". This is an example of such a grism. One can see the rainbow colours as the light is spread out.		Martin with grism Rainbow colours on grism
03:18 **[Dr. J]**		

And how was that used by the scientists? **03:22** **[Martin Kümmel]** Well, the analysis of these short trails allows the detection of emission from glowing hydrogen gas, giving both the distance as well as an estimate of the rate at which stars are formed. **03:34** **[Dr. J]** But could this not be done in a different way? **03:37** **[Martin Kümmel]** Seeing and analysing such small and faint galaxies at such a great distance is at the very limit of the capabilities of the most powerful telescopes. The grisms onboard Hubble are the only instruments that can make this kind of discovery. **03: 25** **[Narrator]** By finding the nine tiny galaxy building blocks we have followed another branch on our Galactic family tree and come a small, but important, step closer to understanding our cosmic roots. We already know about the existence of much more massive – and therefore considerably brighter – galaxies at similarly great distances. How these monsters were assembled so quickly after the Big Bang remains a real puzzle for astronomers. But that is a story for another day... **04:22** **[Dr. J]** With the small galaxy building blocks we are basically witnessing galaxy formation in action. Something that is important if we want to understand our origin on the cosmic scale. This is Dr. J signing off for the Hubblecast. Once again nature has surprised us beyond our wildest imagination … **04:41** **[Outro]** Hubblecast is produced by ESA/Hubble at the European Southern Observatory in Germany. The Hubble mission is a project of international cooperation between NASA and the European Space Agency. **04:58 END**		GRISM image gets extracted and turned into a spectrum 3D zoom on HUDF/GOODS Virtual studio: Dr J on camera
