Key words: Adaptive optics facility, MUSE, AOF, VLT.

ESOcast Episode 119: AOF First Light	
00:00 **[Narrator]** 1. ESO's new Adaptive Optics Facility has just opened its eyes to the sky for the first time. Coupled with the revolutionary instrument MUSE, this is one of the most advanced and powerful technological systems ever built for ground-based astronomy.	Adaptive Optics Facility at Paranal
00:20 **New ESOcast intro**	**00:00** New ESOcast introduction
00:27 **[Narrator]** 2. ESO's Very Large Telescope, or the VLT, is built on the high, dry site of Cerro Paranal in Chile's Atacama Desert. It boasts spectacular observing conditions and over 300 clear nights per year. But turbulence in the Earth's atmosphere still distorts the light of celestial objects, making astronomical images blurry. Ground-based telescopes can't escape the atmosphere like space telescopes can. So to combat this, ESO has transformed the Unit Telescope 4 of the VLT into a fully-adaptive telescope.	VLT at Paranal Animation of turbulence in atmosphere VLT at Paranal
01:16 **[Narrator]** 3. The Adaptive Optics Facility is a cutting-edge system composed of many integral parts. Its four lasers create artificial stars in the upper atmosphere. An adaptive optics module uses these stars to map the turbulence in the atmosphere, then sends calculated corrections to the deformable	Adaptive Optics Facility at UT 4

secondary mirror. This mirror can rapidly change its shape to correct the light it receives from a celestial object, compensating for the atmospheric disturbance.	
01:53 **[Narrator]** 4. The Adaptive Optics Facility has just seen its first light with the powerful MUSE instrument. Using this dream team, astronomers captured spectacular images, revealing sharper details and fainter stars than possible without adaptive optics.	Show images w/ AO and those w/o AO
02:15 **[Narrator]** 5. Astronomers will harness the power of the Adaptive Optics Facility to image faint objects in the very distant Universe — in particular, galaxies still in their infancy. These are key to understanding how galaxies form.	VLT with lasers at night Animation of celestial images
02:35 **[Narrator]** 6. But MUSE is not the only one to benefit from the power of the Adaptive Optics Facility. In a near future, the system will turbo-charge the science produced by the HAWK-I and ERIS instruments. It is also a pathfinder for ESO's next major project, the Extremely Large Telescope, or the ELT. Building the Adaptive Optics Facility has equipped ESO scientists and engineers with invaluable expertise that will now be used to overcome the challenges presented by the ELT.	MUSE and HAWK-I instruments ELT computer animation
03:15 **[Outro]**	ESOcast is produced by ESO, the European Southern Observatory. *ESO builds and operates a suite of the world's most advanced ground-based astronomical telescopes.*