



The E-ELT Science Case

Science Pep Talk #7



9 Prominent Science Cases

“Prominent” science cases are considered to be among the most important scientifically and are useful for defining capabilities of the telescope.

- **Planets and Stars**
 - **From giant to terrestrial exoplanets: detection, characterization and evolution**
 - **Circumstellar disks**
 - **Young stellar clusters**
- **Stars and Galaxies**
 - **Imaging and spectroscopy of resolved stellar populations in galaxies**
 - **Black holes and AGN demographics**
- **Galaxies and Cosmology**
 - **Physics of high redshift galaxies**
 - **First light – The highest redshift galaxies ($z > 10$)**
 - **Is the low-density IGM metal-enriched?**
 - **A dynamical measurement of the expansion history of the Universe**

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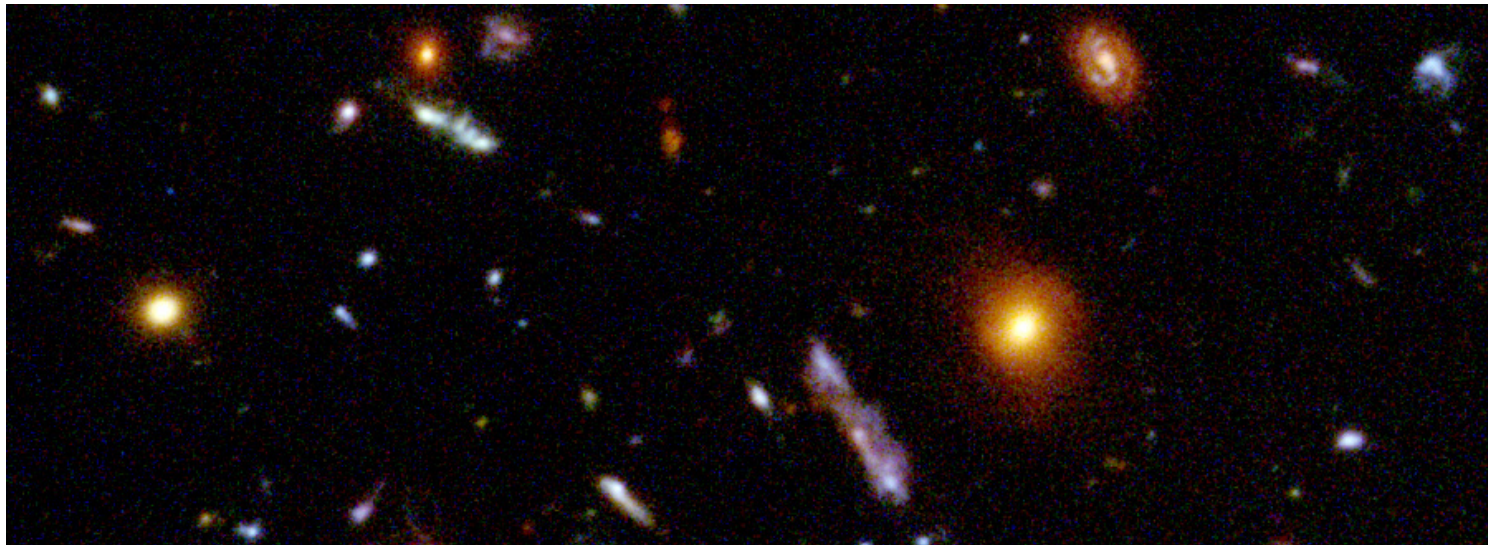
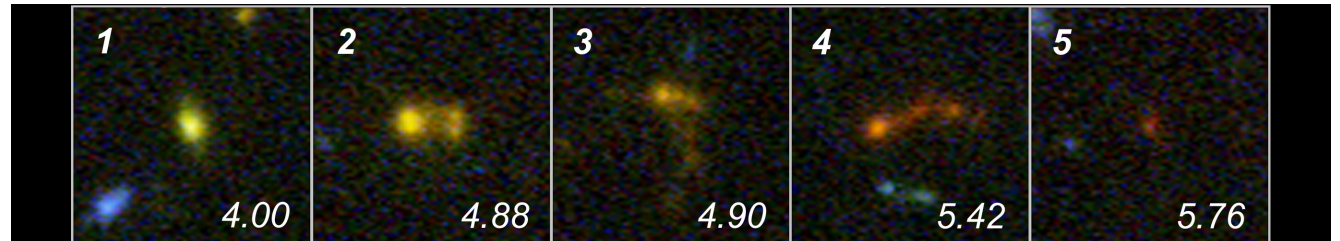
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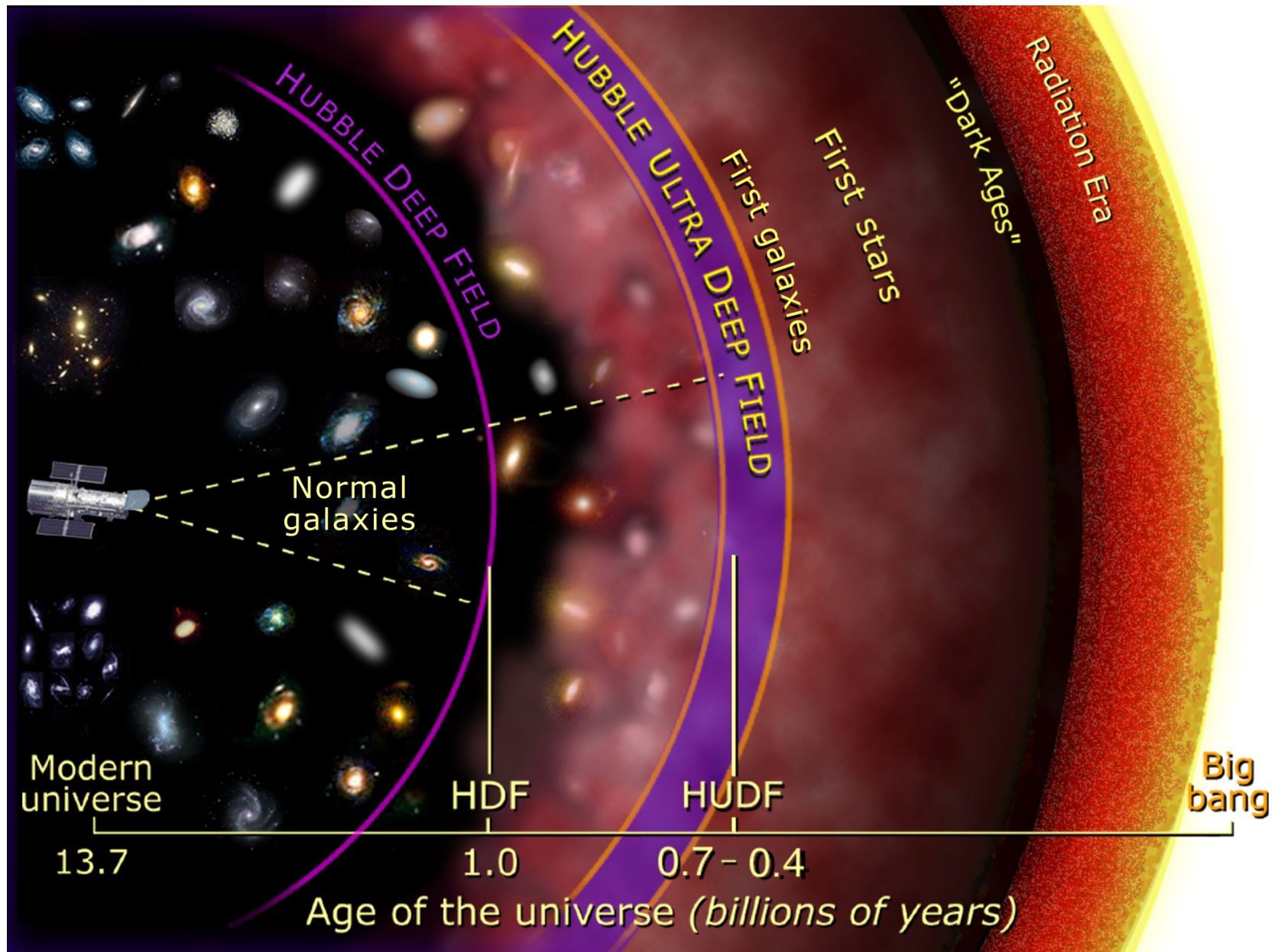


The topic is the first generation of galaxies

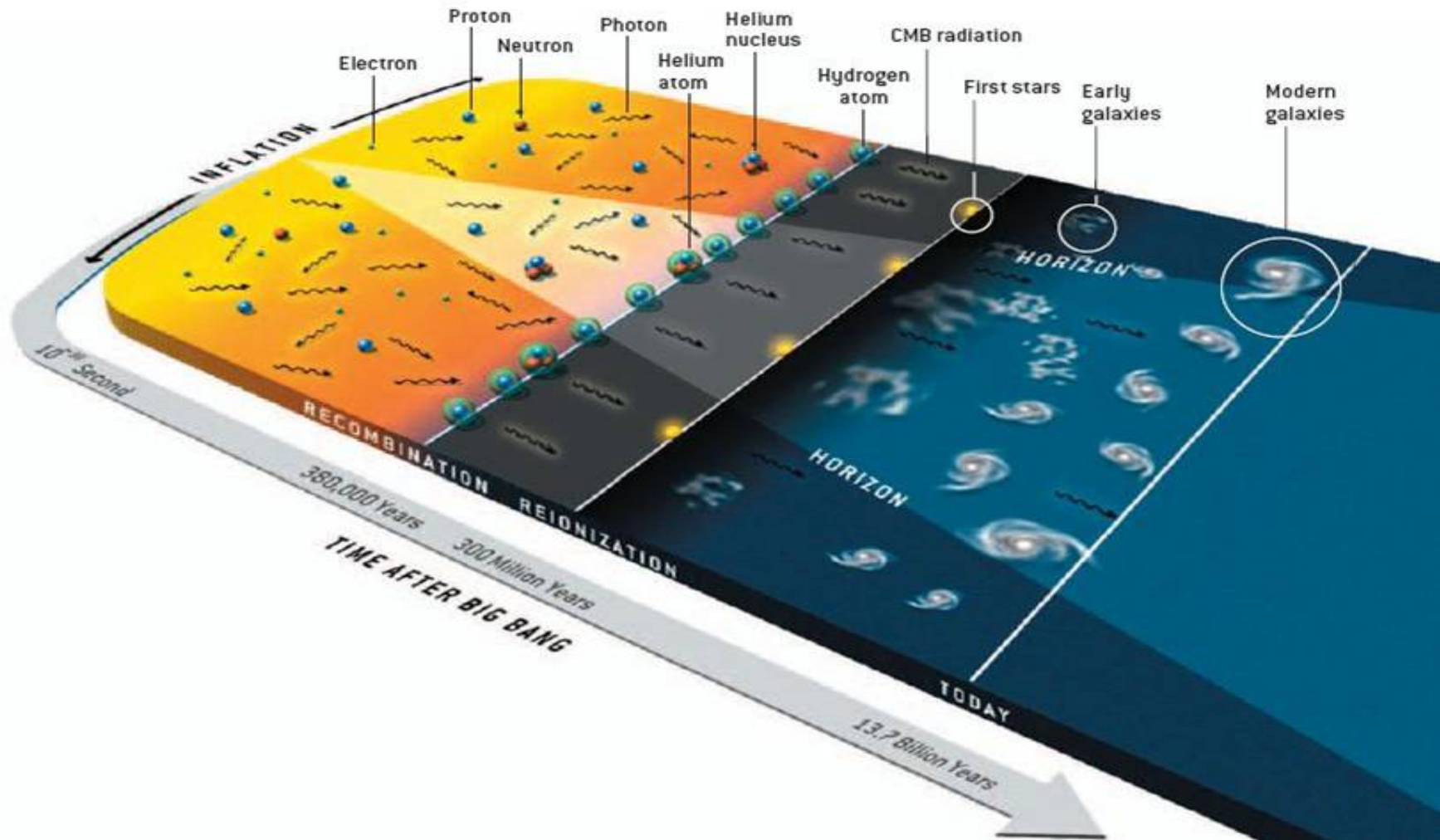


When did the very first galaxies form
and what were their properties?

The topic is the first generation of galaxies



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Questions for the E-ELT

First galaxies:

- How was galaxy formation kicked off?
- What is their abundance and luminosity function?
- Are they responsible for the reionization of the Universe?
- Are they like the high-redshift galaxies currently known, or are they fundamentally different?
- Are their stars made from pure hydrogen and helium, i.e. primordial material?
- What is the mass of their dark matter halos?

E-ELT will answer...

...by providing:

- Spectroscopy of the faintest blobs seen in the deepest images available!
 - In detail: very deep (pushing the limits), spatially integrated (probably GLAO), low-resolution (but have to work between sky lines), multi-object (multiplexity ~ 30), NIR (JHK) spectroscopy of candidate galaxies identified by JWST, HST and VISTA.
- Surveys of the very first galaxies at the end of the Dark Ages.

