First Brown Dwarfs in Globular Clusters

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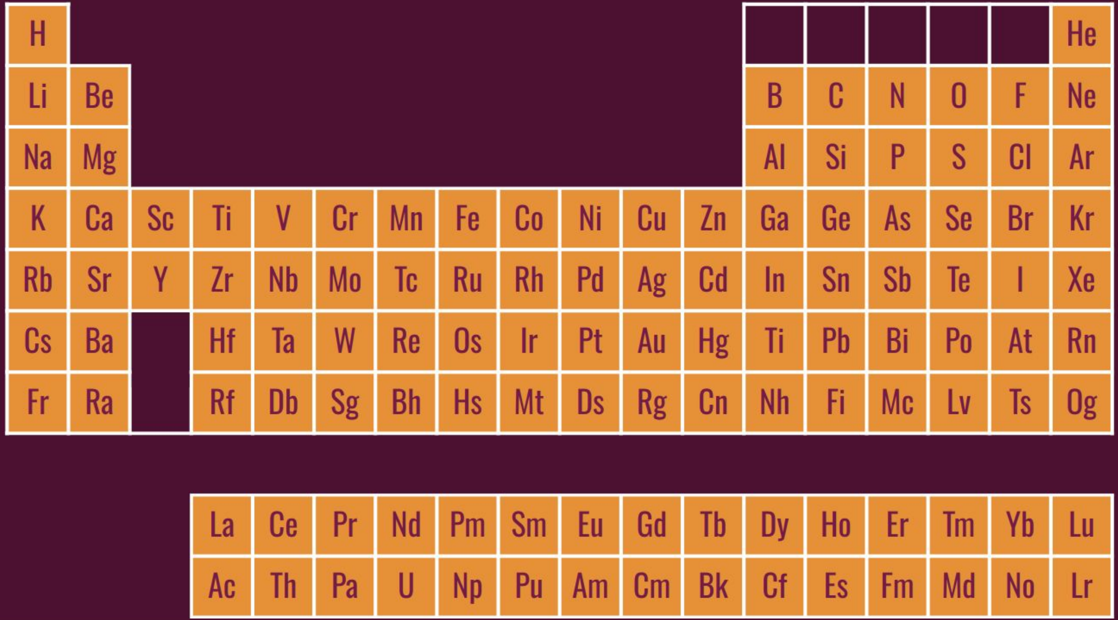
Background: NGC 6397, JWST NIRCam

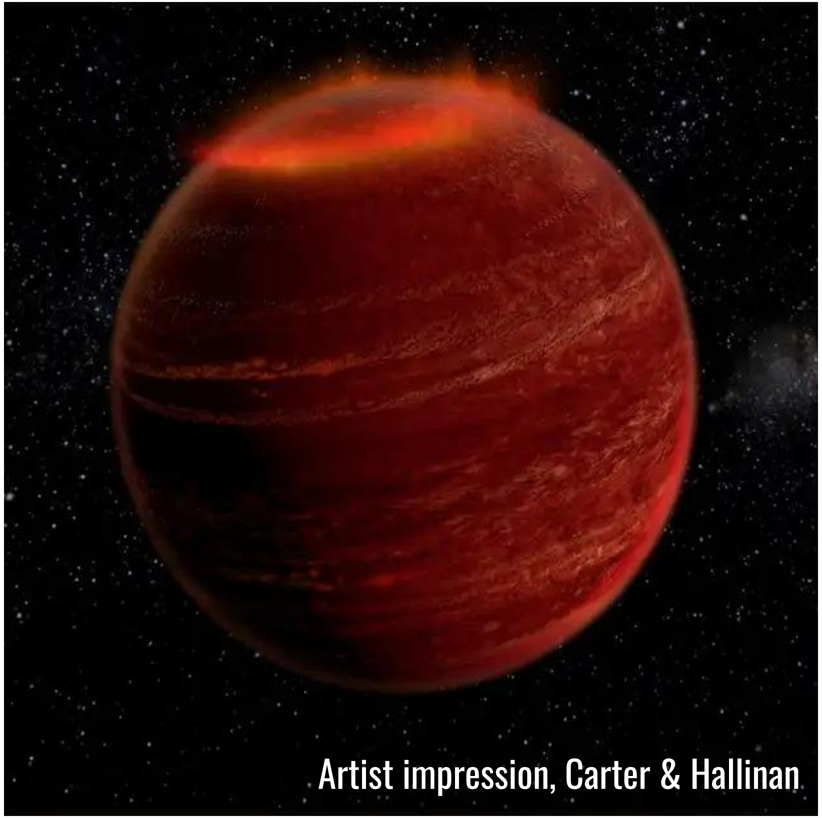
Galactic Archaeology



Globular Clusters

Chemical composition?

Age?



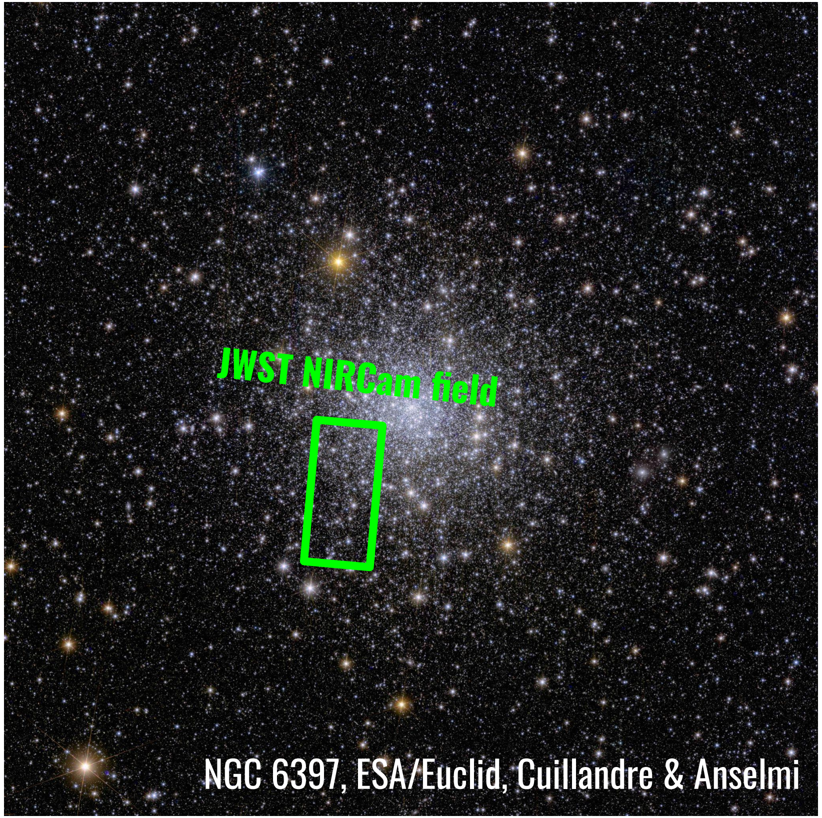
Brown Dwarfs

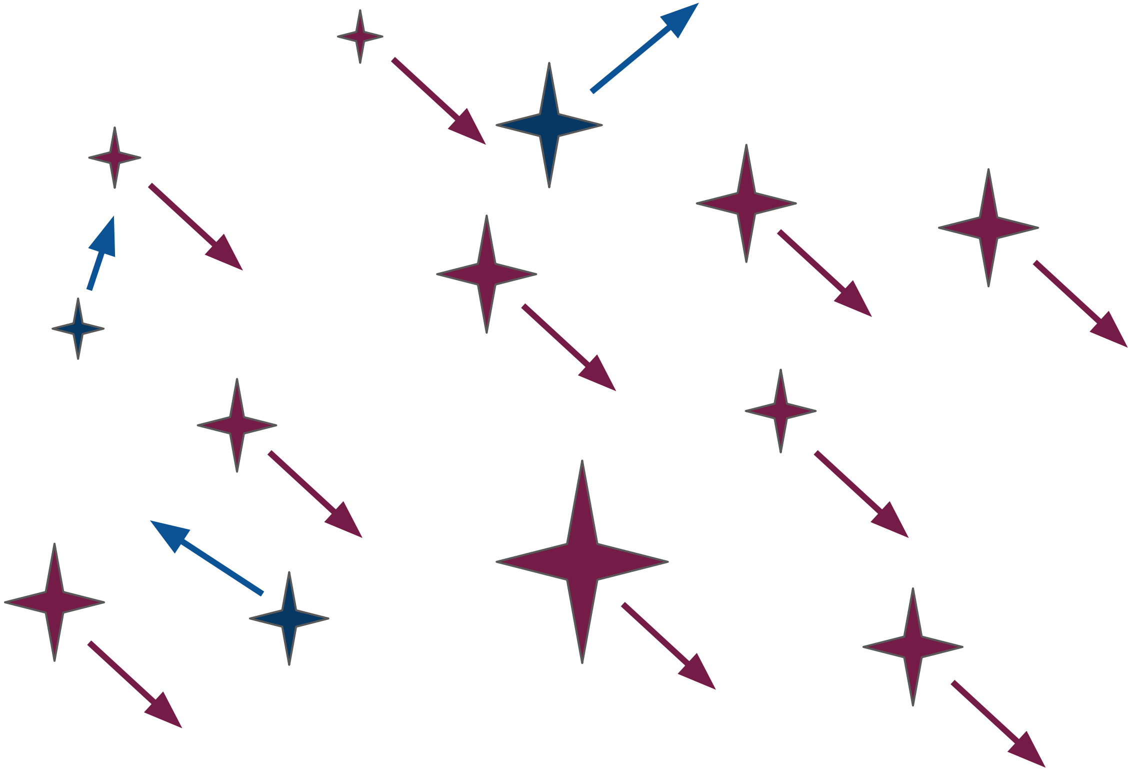
- → Mass $\lessapprox$ 8% solar
- → No hydrogen fusion
- → Cool down over time
- → *Galactic chronometers*

Brown Dwarfs in Globular Clusters are **cool and faint**

JWST NIRCam

Program *GO-1979* (PI: **Bedin**)
Year: **2023**
Exposure: **2 hours**





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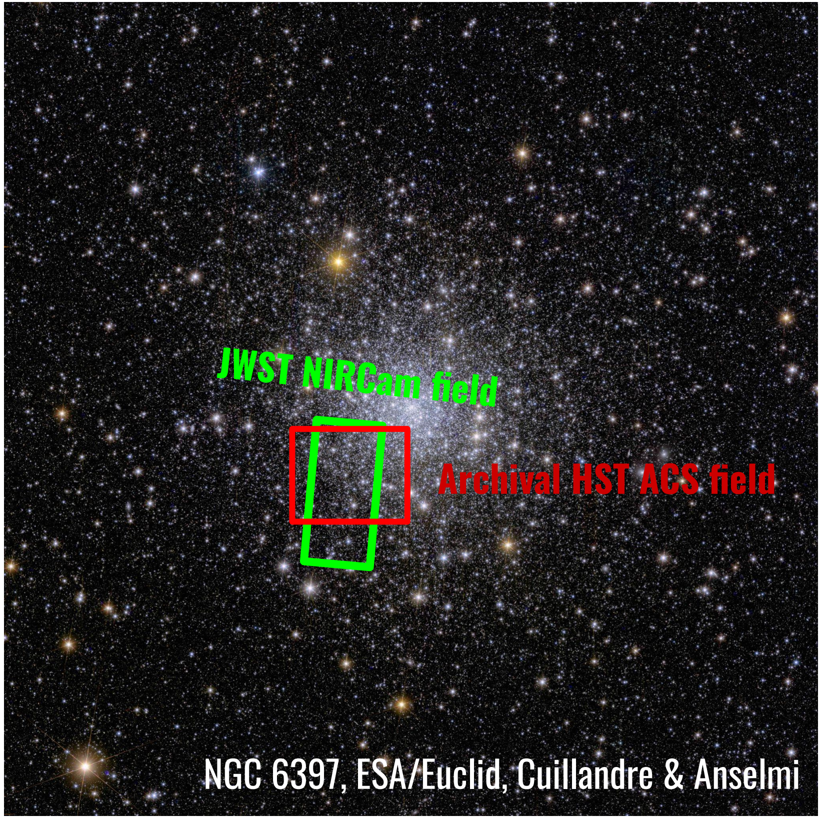
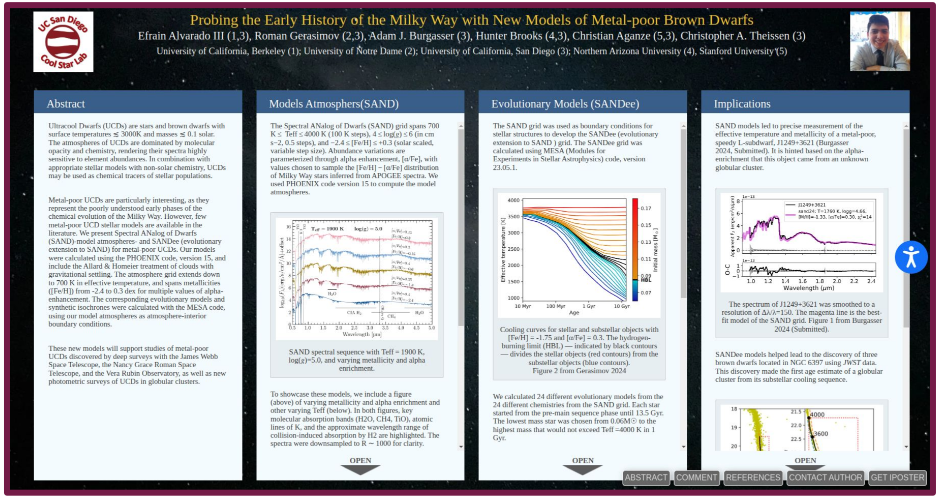


HST ACS

Program *GO-10424* (PI: **Richer**)
Year: **2005**
124 orbits

Measuring the Temperatures

Efrain **Alvarado III**



Poster 406.04, **Thursday 9 am**

Temperature	1756 ± 111 K	1629 ± 102 K	1388 ± 123 K
Radius	77% Jupiter	75% Jupiter	72% Jupiter

Brown Dwarfs in Globular Clusters

- → **BD 1756**, **BD 1682** and **BD 1388** are brown dwarf members of **NGC 6397**
- → First confirmed brown dwarfs in a globular cluster
- → Oldest known brown dwarfs with reliable ages: **~13.5 Gyr**

- → *Hundreds more can be discovered with a second JWST visit*