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Light, Stars, Chemistry: Webb sheds light on Carbon-based Molecules in Space

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Light, Stars, Chemistry: Webb sheds light on Carbon-based Molecules in Space

While mankind's scientific quest to unearth the mysteries of the Universe dates back to antiquity, the Molecular Universe and light from molecules in space only appeared in the 1960s. The advent of spectroscopy of the infrared sky, in particular, revealed broad features in the rainbows of light from myriad objects, from dusty nurseries of planets and newborn stars to the sparse space between stars. These unique fingerprints are now attributed to a particular family of carbon-based molecules, called Polycyclic Aromatic Hydrocarbons (PAHs). PAHs profoundly change the chemical and physical landscapes of their host environments and carry 10-15% of the entire known budget of carbon in the cosmos. My research focuses on understanding the properties of these molecules as observed aglow under the sight of the James Webb Space Telescope - the powerful space observatory allowing us to gain insight into these peculiar molecules as never before.



The inner region of the Orion Nebula as seen by the James Webb Space Telescope's NIRCam instrument. This is a composite image from several filters that represents emissions from ionized gas, hydrocarbons, molecular gas, dust and scattered starlight. Most prominent is the Orion Bar, a wall of dense gas and dust that runs from the top left to the bottom right in this image. (NASA, European Space Agency, Canadian Space Agency/Data reduction and analysis: PDRs4All ERS Team; graphical processing S. Fuenmayor)

Image Credit: CBC