Chandra Science Highlight

The Give and Take of Mega-Flares From Stars

Caption: This composite image shows the Lagoon Nebula, a star-forming region in our galaxy. X-rays from Chandra (purple) are combined with infrared data from Spitzer (blue, gold, white). This is one of 40 star-forming regions studied. The flares observed by Chandra occur in all of the star-forming regions and among young stars of all different masses, including those similar to the Sun.

- The largest study of X-ray flares from young stars has been made, using Chandra observations of 24,000 stars in 40 star-forming regions.
- Researchers identified and studied flares from over 1,000 young stars, all of which are much more powerful than those seen from our Sun today.
- These flares can drive gas away from disks of material surrounding them, possibly triggering the formation of small rocky material that is a crucial step for planets to form.
- The flares can also blast atmospheres of planets with powerful radiation, which may result in the complete evaporation and destruction of these atmospheres in less than 5 million years.

Distance estimate: About 4,400 light-years.

Credits: X-ray: NASA/CXO/Penn State/K. Getman, et al; Infrared: NASA/JPL/Spitzer.

Instrument: ACIS

References: Getman, K.V., and Feigelson, E.D., 2021, ApJ (accepted); arXiv:2105.04768

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