



Centaur Activity, Outbursts and Explosions

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Centaurs, the population of small bodies that occupy the region of our solar system between the orbits of giant planets, are inextricably linked with the phenomenon of cometary activity, including as the direct source of short period comets [1]. The first recognized member of the Centaur population discovered was 95P/Chiron [2], and it was active [3] as discerned from the Centaur's brightening after its discovery.

We provide a discussion and overview of Centaur activity, as presented in our chapter in the "Centaurs" book by IOP publishing [4]. This includes outbursts, comae, ejections, and disruptions, among other phenomena relating to morphology. The effects of such activity on Centaurs are analyzed in detail, offering insights into their dynamic behavior and evolutionary processes. We explore how these phenomena are observed and interpreted from Earth, providing a valuable perspective on the observational techniques and data analysis methods used in Centaur research. We will also update the material based on more recent observations and present recent studies on more distant activity in Centaurs by the authors [5].

[1] Horner, J., Evans, N. W., & Bailey, M. E. 2004, *MNRAS*, 354, 798.

[2] Kowal, C. T., Liller, W., & Chaisson, L. J. 1977, *IAU Colloq.*, 3147, 1.

[3] Tholen, D. J., Hartmann, W. K., Cruikshank, D. P., et al. 1988, *IAU Colloq.*, 4554, 2.

[4] Bauer, J., Ivanova, O., McKay, A., and Sarid, G. 2025. Activity, Outbursts and Explosions. *in Centaurs, ed. by. Volk, K., Womack, M., and Steckloff, J.* IOP Publishing.

[5] Bauer, J. M. et al. 2025. **M.P.E.C. 2025-A144.**