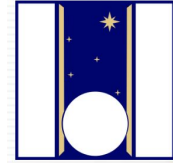


# EXORCISM



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EXOR optiCal and Infrared Systematic Monitoring: optical and near-infrared spectroscopic follow-up of eruptive variables alerted by Gaia

## Abstract

Young eruptive variables are rare Young Stellar Objects (YSOs) that display large photometric outbursts ( $\Delta V > 2$  mag) associated with a dramatic increase of the mass accretion rate. Episodic outbursts can have significant implications for the evolution of the protostars, the circumstellar disks, and their surroundings. Until a few years ago, less than 50 eruptive variables had been discovered. Recently, however, the interest of the community has grown significantly thanks to the discoveries of new candidates obtained by Gaia and in view of the forthcoming LSST survey. As a spectroscopic follow-up of these surveys, we are carrying out the EXORCISM program, which uses LBT/TNG/ESO instrumentation to determine the physical properties of the EXor/FUor both in quiescence and in outburst.

Project based on low- and high-resolution spectroscopic data in the framework of the large JEDI (JEtS and Disks@INAF) and STRADE (Spectroscopically TRAcIng the Disk dispersal Evolution) collaborations

EXORCISM is a collaboration between INAF (OAR, OAC, OAPa), Konkoly Observatory (Hungary), TNG, ESO

Observations taken with : LBT (MODS, LUCI); VLT (XShooter); TNG (GIARPS, NICS, Dolores); NTT (SoFI, EFOSC, SoXS); REM; Vera Rubin: Public surveys (Gaia, ZTF, ASASS-SN, PAN-STARRS)

## FUNDS RECEIVED: 6000 Euro

## RESULTS AND ACTIVITIES SUPPORTED BY THIS GRANT

1. **POSTER** : “PROJECT-J The embedded jet and molecular flow of HH46 IRS observed with JWST” *presented at the Protostars and Planets VII - Kyoto (April, 2023)*
2. **PAPER** : “Gaia23bab: a new EXor ” *submitted to The Astrophysical Journal*

## PAPERS PUBLISHED IN 2023 WITHIN THE EXORCISM COLLABORATION

1. **Gaia21bty: An EXor light curve exhibiting a FUor spectrum**: Siwak, M.; Hillenbrand, L. A.; Kóspál, Á.; Ábrahám, P.; Giannini, T.; et al. ; 2023 MNRAS, 524, 5548
2. **Brightness and mass accretion rate evolution during the 2022 burst of EX Lupi**: Cruz-Sáenz de Miera, F.; Kóspál, Á.; Ábrahám, P.; Claes, R. A. B.; Manara, C. F.; Wendeborn, J.; Fiorellino, E.; Giannini, T.; et al. I. 2023, A&A, 678, A88
3. **The Gaia alerted fading of the FUor-type star Gaia21elv**: Nagy, Z.; Park, S.; Ábrahám, P.; Kóspál, Á.; Cruz-Sáenz de Miera, F.; Kun, M.; Siwak, M.; Szabó, Z. M.; Szilágyi, M.; Fiorellino, E.; Giannini, T.; et al. 2023, MNRAS, 524, 3344.
4. **Young Stellar Objects, Accretion Disks, and Their Variability with Rubin Observatory LSST**: Bonito, R.; Venuti, L.; Ustamujic, S.; Yoachim, P.; Street, R. A.; Prisinzano, L.; Hartigan, P.; Guarcello, M. G.; Stassun, K. G.; Giannini, T.; et al. 2023, ApJS, 265, 27

NEXT YEAR : new (mini?) grant application