MINIGRANT RSN1

Searching for UV ultra-fast outflow (UFO) in AGN by exploiting wide-area public spectroscopic surveys

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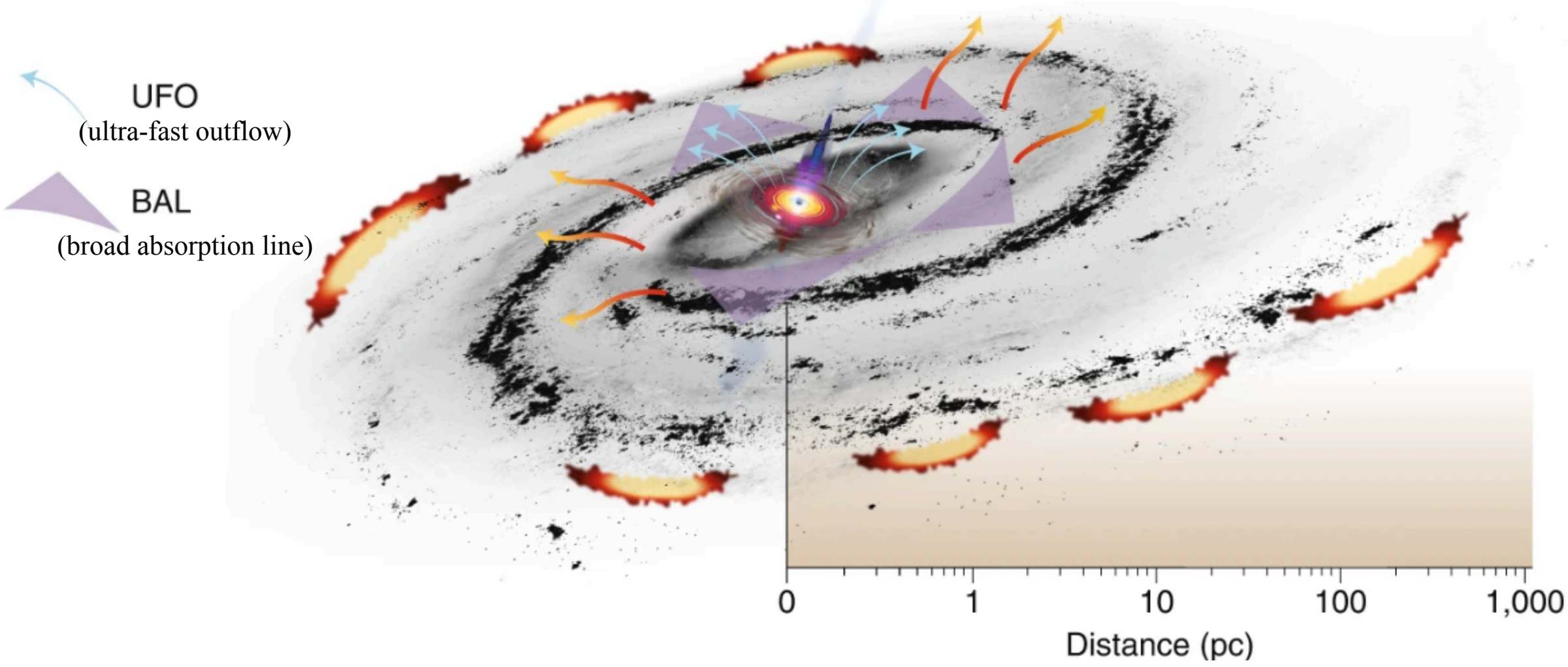


Adapted from Laha et al. 2021 Nat. Astr

Summary of the project & Budget breakdown

Goal: Assess whether UV ultra-fast outflows (UFOs) are a viable and common feedback mechanism in QSOs

Methods: search for UFO (v~0.1-0.2c) candidates, observed as absorption lines in the UV, in quasars from large public spectroscopic surveys and follow-up studies of specific cases and statistical samples

Participants: PI: G. Vietri (INAF IASF-Milano); co-I: M. Polletta (INAF IASF-Milano)

Requested/Awarded: 8000 € for collaboration meetings and international conferences

Scheda INAF associated: Galaxy and AGN Evolution Studies with Large Spectroscopic Surveys

Budget breakdown: Approximately half of the bugdet (~4300 eur) already used to support:

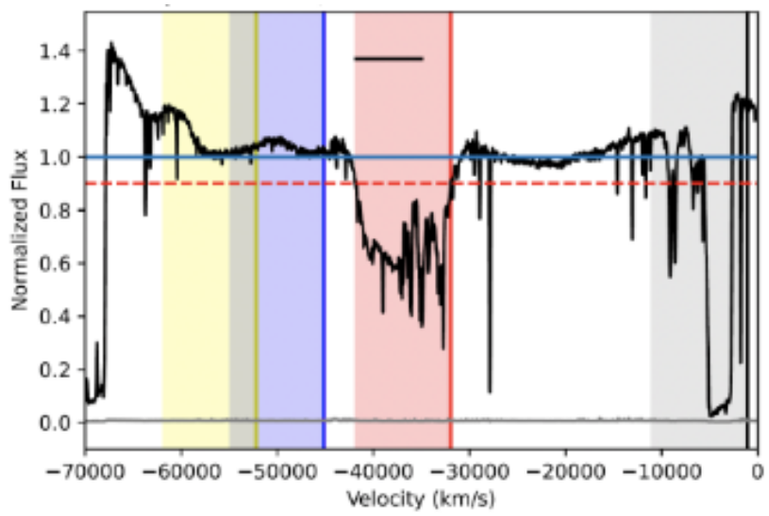
- Collaboration meeting in Rome
- Collaboration meeting in Bologna
- Conference in Easton/USA - Contributed talk
- Conference in Bajina Basta/Serbia - Invited talk

No significant criticalities

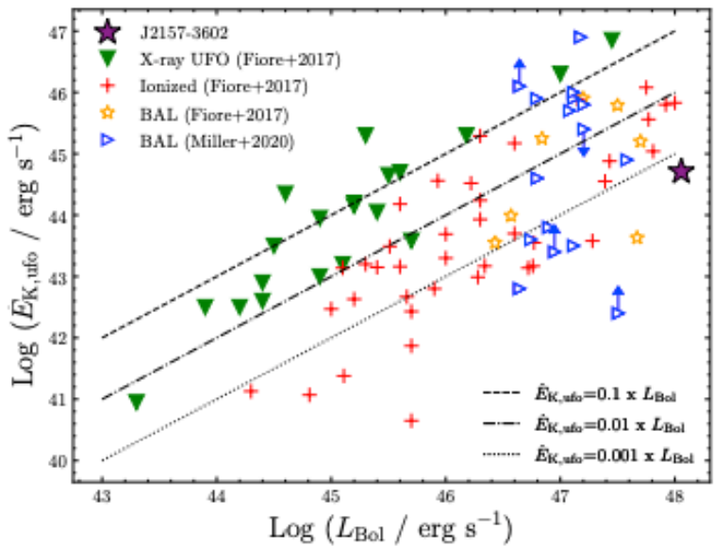
Status of the project: milestones and deliverables achieved

Project 1: Discovery of the UV UFO-BAL in the most luminous known quasar, SMSS J2157-3602, at z=4.692

- Data: VLT Xshooter, Keck/NIRES spectra
- Milestones: velocity, equivalent width (EW), column density and kinetic power using custom Python scripts and numerical code Cloudy (Ferland et al. 2017)
- Deliverable: Paper to be submitted (Vietri et al.) "Study of an Extremely-High Velocity Outflow in SMSS J2157-3602, the most luminous quasar in the universe"
- Supporting proposals: 1 observing proposal submitted to study the outflow variability (VLT/UVES)



CIV (1549Ang) UFO BAL with a maximum speed of ~40,000 km/s (red area)



Outflow kinetic power vs. bolometric luminosity of SMSS J2157-3602 (purple star) compared with those measured in various samples of AGN from the literature

Project 2: Built a catalog of 10 UV UFO-BALs in luminous QSOs from SDSS/BOSS survey

- Data: SDSS/BOSS spectra
- Milestones: velocity, EW, column density
- Deliverable: SDSS/BOSS spectral analysis on-going and a paper is in preparation
- Supporting proposals: 3 observing proposals submitted to study UV UFO-BALs variability

√ One already approved (LBT/MODS);

⏳ Two are in the referee distribution system (VLT/UVES - Subaru/FOCAS)

- Next steps: studying the variability of the outflow, constraining outflow distance and kinetic power