

The Cosmic Optical Background excess and dark matter

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with

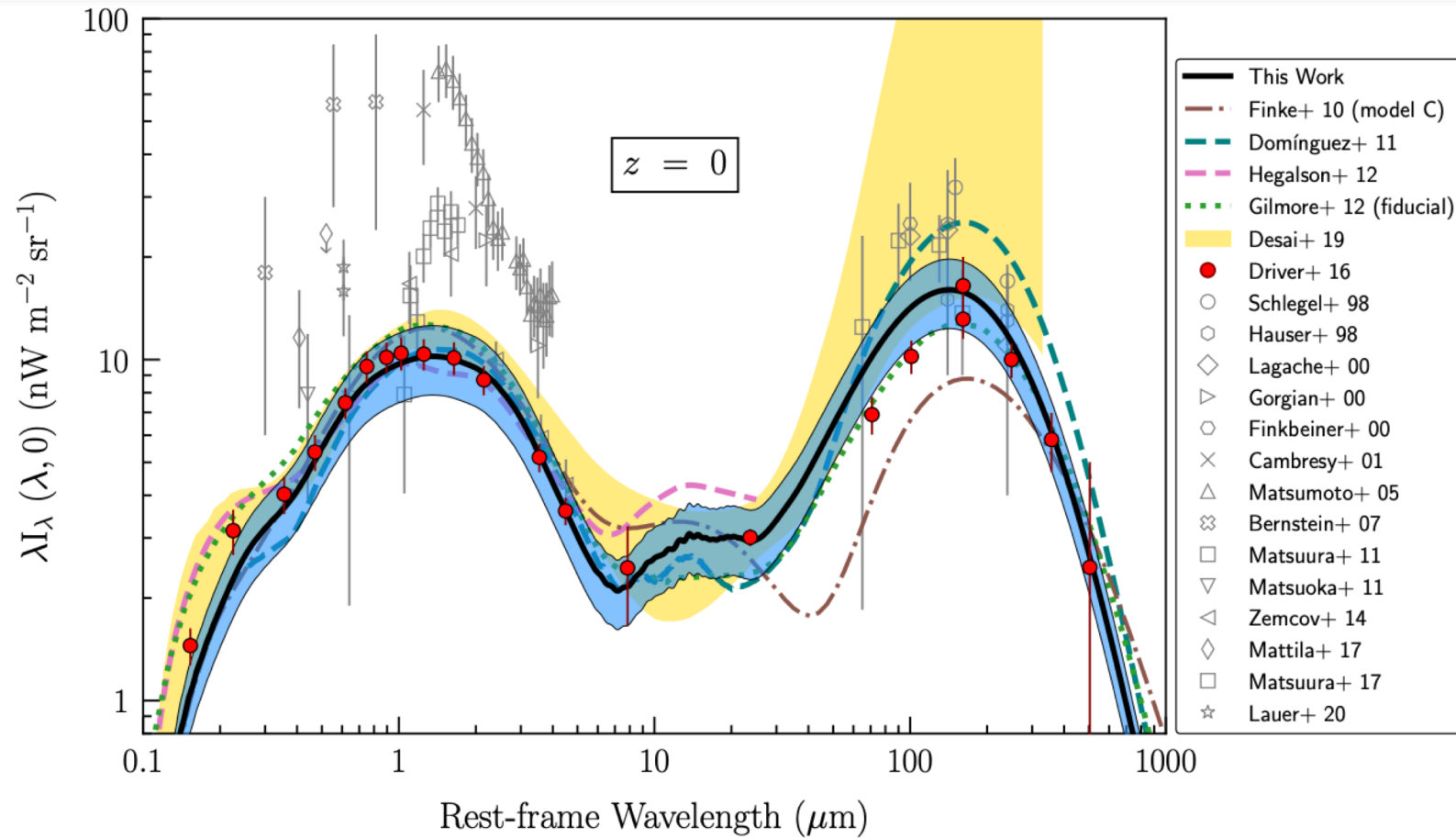
Gabriela Sato-Polito and Marc Kamionkowski
arXiv:2203.11236

Second Eucapt Annual Symposium
24/05/2022



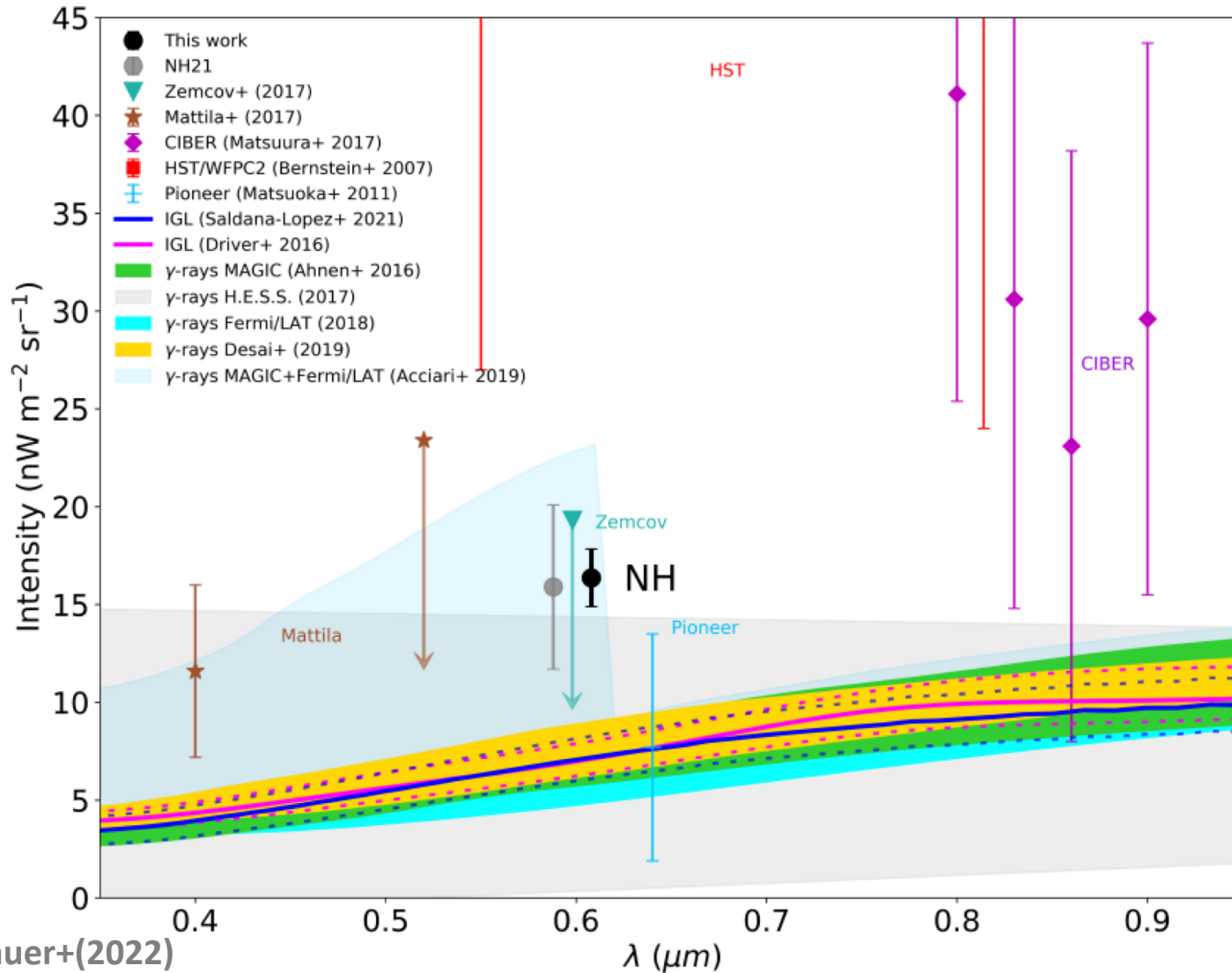
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Extragalactic Background Light



- All redshifted radiation
- Census of all emitters (galaxies)
- Hard to measure directly –
Zodiacal light
- Other approaches (blazars,
inference from IGL, ...)

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- New observations from New
Horizons at 0.61 microns

$$16.37 \pm 1.47 \text{ nW/m}^2/\text{sr}$$

$$8.06 \pm 1.92 \text{ nW/m}^2/\text{sr}$$

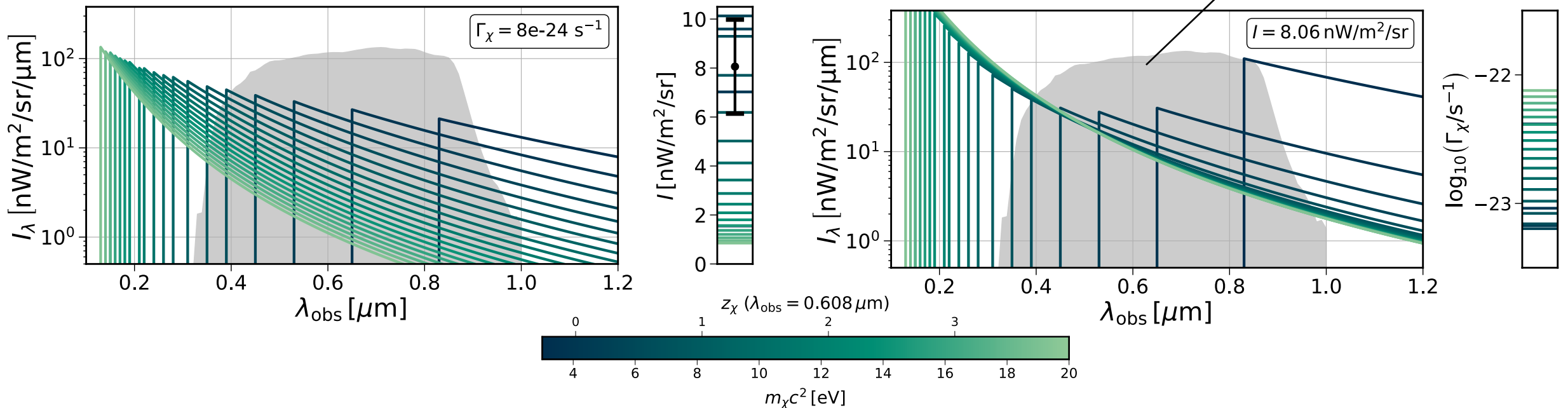
Explanations for the excess?

- Misestimation of the abundance of faint galaxies (extrapolated to estimate IGL) [Conselice+\(2016\)](#)
- Intra halo light [Cooray+\(2012\)](#), [Zemcov+\(2014\)](#), [Matsumoto+\(2019\)](#)
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- **Dark matter decays?** $I_\lambda \propto \frac{\Gamma_\chi}{\lambda_{obs}(1+z)H(z)}$



Does DM decay really work? – maybe!

- Parameter region \sim unconstrained
- Overlaps with hint from γ -ray extinction
Korochnik+(2019)
- Challenged by HST power spectrum (complicated measurement, being reassessed)
Nakayama+(2022)
- Will be probed by LIM (strongest sensitivity in this range, SPHEREx + HETDEX)
Bernal+(2021)
- We'll keep looking at this range!

