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# Implications of the FIR-radio correlation for CR acceleration

Mark Walker\*<sup>1</sup>

<sup>1</sup>Manly Astrophysics – 15/41-42 East Esplanade, Manly, NSW 2095, Australia

## Abstract

The far-infrared - radio correlation is rightly famous as one of the tightest correlations in extragalactic astronomy, but a convincing explanation of the underlying physics has not yet emerged. As the FIR is thermal dust emission, and the radio is mainly synchrotron, it is natural to look for explanations in which the dust is heated by cosmic rays. There are three key problems with any such model. I'll summarise these problems and show that two of them, relating to the dust physics, are easily sidestepped. The third relates to the physics of cosmic-ray acceleration and is more problematic, as I'll describe in the context of our own Galaxy. The challenge is to achieve efficient cosmic-ray acceleration in the environments of massive stars.

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\*Speaker