

W205a **A SPICA far-IR imaging spectrometer SAFARI – RMP activities**

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SAFARI (SpicA FAR-infrared Instrument) is an imaging F ourier Transform Spectrometer designed to provide continuous spectral coverage in photometry and spectroscopy from 34 to 210 μm with a high sensitivity of $\sim 3 \times 10^{-19} \text{ Wm}^{-2}$ at 48 μm (5σ , 1 hour). A high spectral resolution of $R = 1000 \sim 6000$ (~ 1000 at 210 μm , ~ 2000 at 100 μm , and ~ 6000 at 34 μm) will be achieved with selectable spectral resolution modes of $R \sim$ few hundred and $20 < R < 50$.

Highly sensitive TES detector technology is being development to accomplish SAFARI's superior capability; the technical demonstrations have been made for fabricating ultra-low noise ($\text{NEP} = 2 \times 10^{-19} [\text{W}/\sqrt{\text{Hz}}]$), large pixel-formatted (384 pixels corresponding to $2' \times 2'$ FOV) detector arrays with high optical coupling ($> 60\%$) and a signal readout technique by using 160-channel frequency-domain multiplexing is under tested.

A wide variety of science cases are to be covered by SAFARI, including galaxy evolution, planetary system formation and tracing the transmigration of interstellar matter. These are the central questions that are to be investigated by SPICA as a 3m-class large and $< 6\text{K}$ cooled telescope. Further optimisation of the SAFARI's specifications is pursued based on the achieved detector technologies to maximise the scientific outcomes.

We present the current technology development status and the planned activities in 2014.