# An idea to measure the arrival direction of wavy dark matter using the Moon

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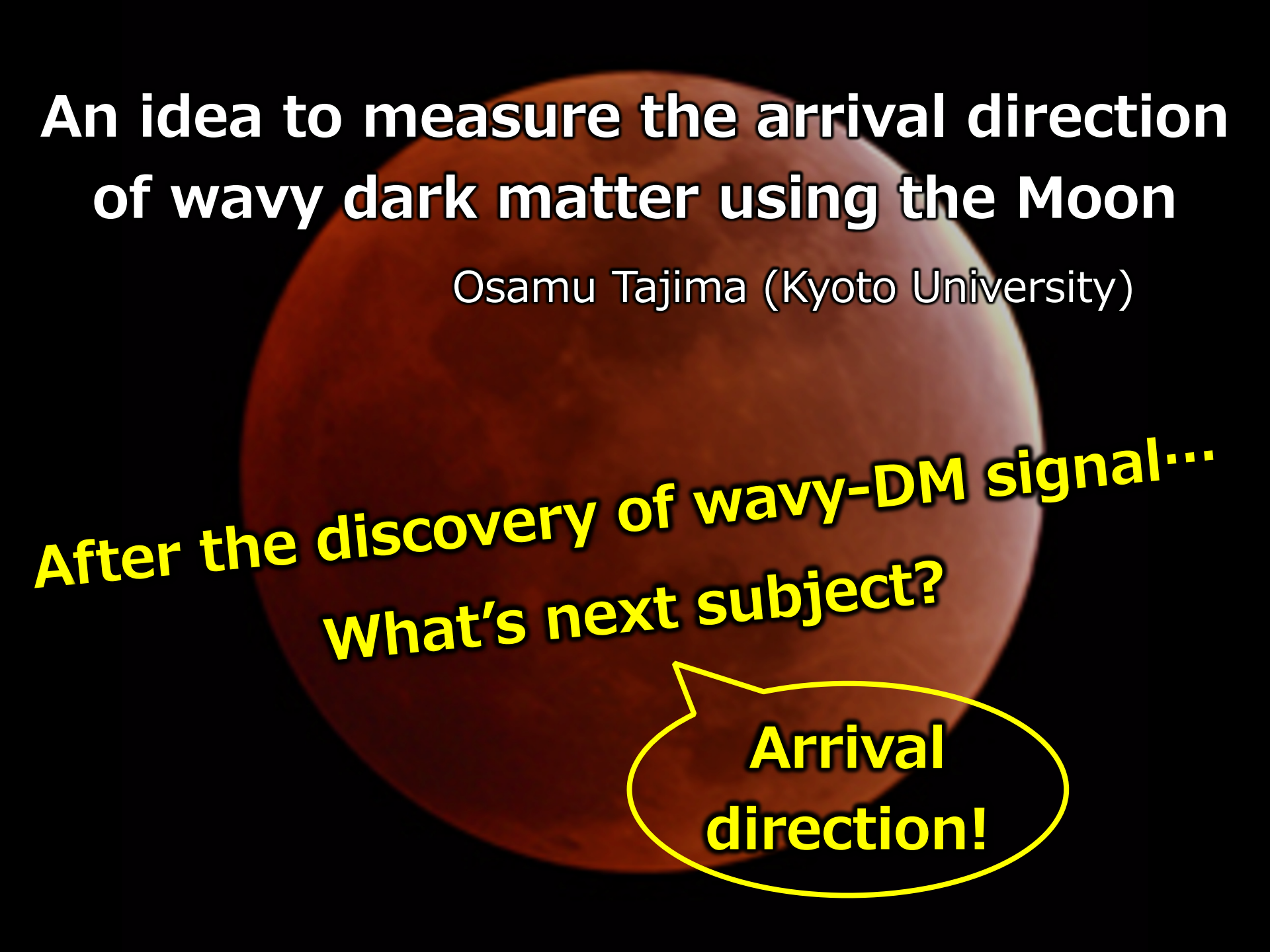
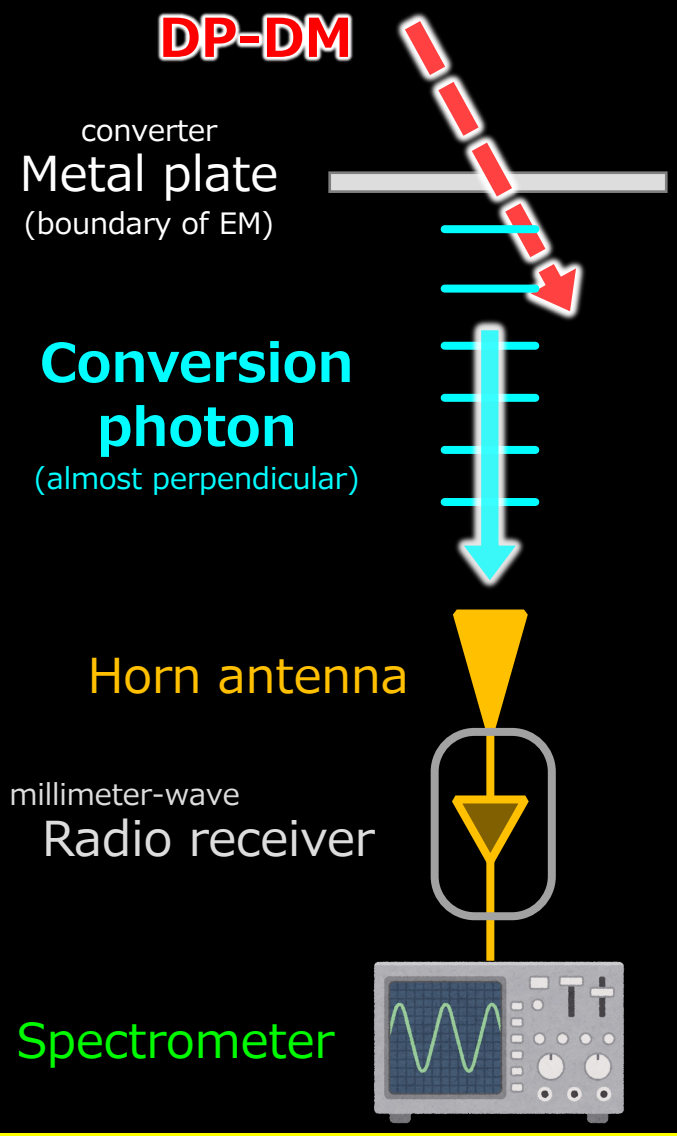
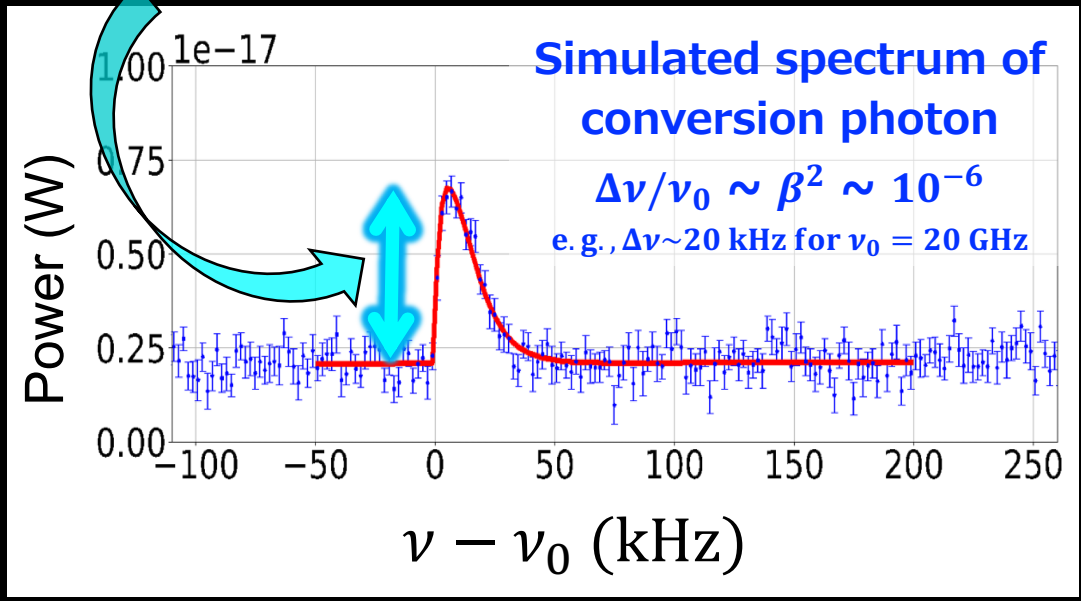


# Detection principle of DP-DM

D. Horns et al. , JCAP 1304, 016 (2013)




Peak height $\propto \chi^2$




Peak frequency corresponds to mass

$h\nu_0 \simeq m_{\mathrm{DP}}c^2$ e.g., 20 GHz $\Leftrightarrow 80\,\mu\mathrm{eV}/c^2$

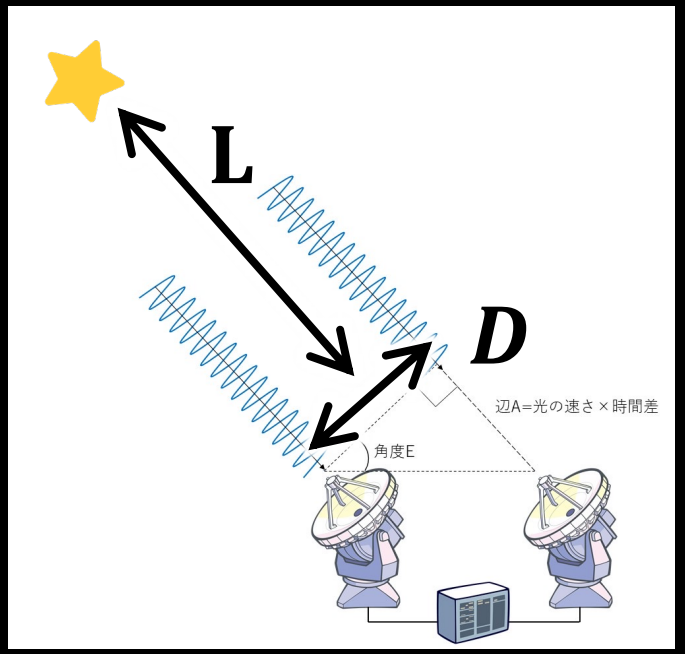
**Need fine angular resolution of 0.01° to identify the arrival direction**

Con.

# Diffraction limit and far-field condition

Angular resolution~ 0.01°

$$\Omega \simeq \frac{\lambda}{D} \rightarrow D \simeq \frac{\lambda}{\Omega} \sim 100\ \mathrm{m}$$




https://alma-telescope.jp/column/almabasics-2

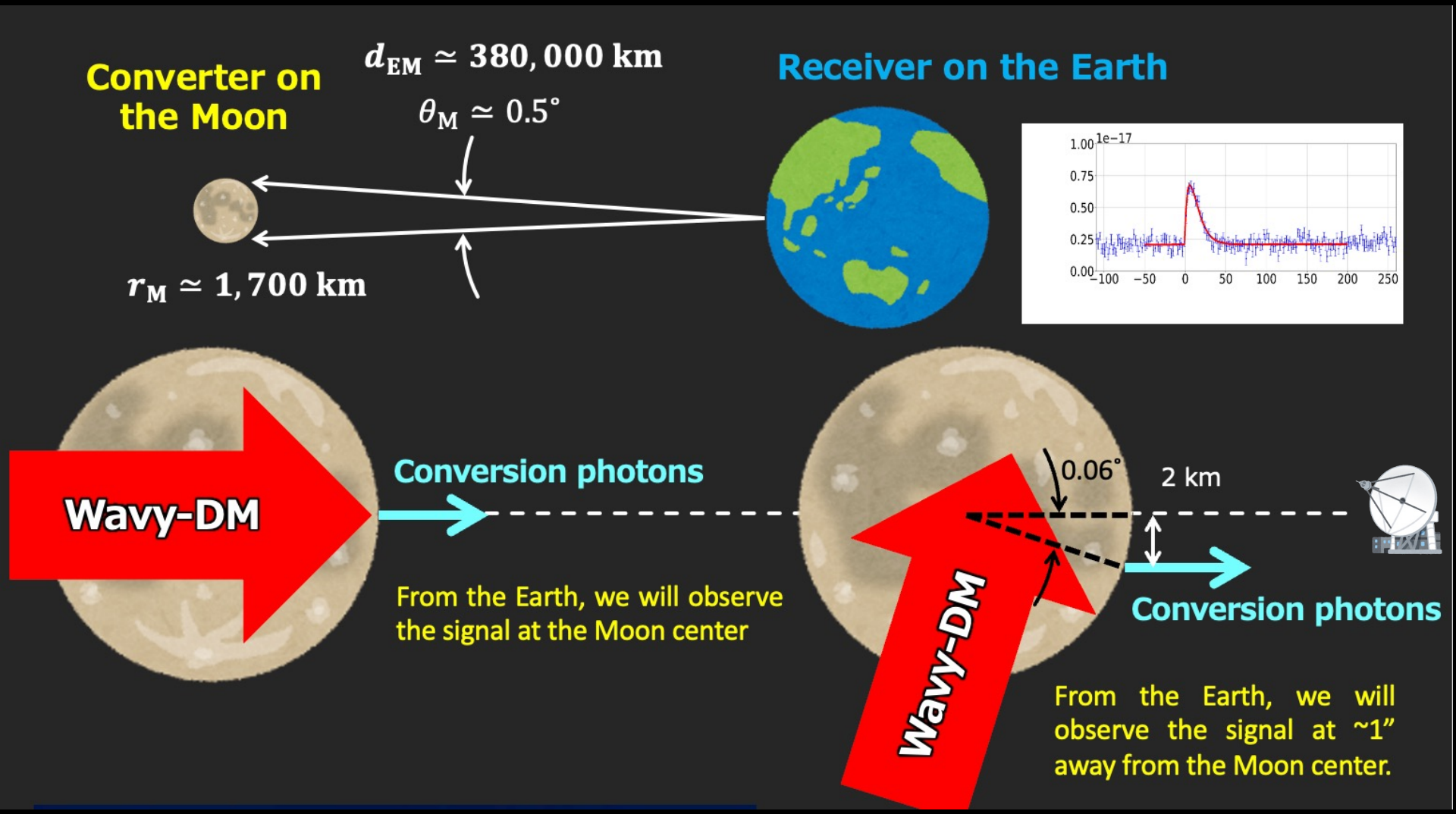
$$\mathrm{L} = \frac{2D^2}{\lambda}$$

$$\rightarrow \mathrm{L} \simeq \frac{2\times(100\ \mathrm{m})^2}{1.2\ \mathrm{cm}} \simeq 1,700\ \mathrm{km}$$

(ref) Alt. of ISS: 408 km

**Need space-scale setup!**

# Basic idea: the Moon & the Earth




**Please come to my poster for further discussions!**