

# Relativistic electron acceleration with mJ lasers at Multi kHz repetition rates

**M. Krishnamurthy\***

TIFR Hyderabad

\* Correspondence: mkrism@tifr.res.in

## **Abstract:**

Intense ultrashort pulse lasers generate relativistic electrons when the intensity reaches relativistic scales,  $10^{18} \text{ Wcm}^{-2}$  for 800nm pulses. This requires Terra watt class lasers that are complex, cumbersome, expensive and deliver typically 10 pulses per second. While the electron/x-rays/proton beams generated from such system have shown a lot of promise, developing applications on such systems is very challenging. I will talk about experiments where even at a  $1/100^{\text{th}}$  of laser intensity, it is feasible to generate relativistic electron beam of 1 MeV energy with multi kHz few mJ/pulse lasers. We show that plasma wave instabilities generated and manipulated with suitable targetry is the underlying mechanism. The source size of the short pulse electron beam is amenable for x-ray radiography and shadowgraphy.