



復旦大學

Fudan University



## 復旦大學物理系物質科學報告

### Physics Department Colloquium

## From wave-particle duality to one-stone-three-bird cancer detection imaging

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**Abstract:** The basic physics of image formation in x-ray imaging, including x-ray computed tomography (CT), has essentially remained unchanged since Röntgen first discovered x-rays in 1895. Accordingly, the photoelectric effect, which is a phenomenon born of the particle nature of x-ray photons, has been the predominant contrast mechanism in x-ray imaging for cancer detection. In this Colloquium, the fundamental wave-particle duality of x-ray photons is fully utilized so that both the particle nature and the wave nature of photons can simultaneously be used in an x-ray grating interferometer to encode and decode information about the image object. As a result, three types of images (conventional absorption contrast, differential phase contrast, and dark-field contrast) with complimentary information can be generated from the same acquired data set to advance current cancer diagnosis.

One of the main purposes of this colloquium is to motivate physicists to step out of their comfort zones in research and education so they may leverage physics to have a high impact on the healthcare and daily life of the general public.

**Time: 10:30 am, Thursday, June 8, 2017**

**Location: Physics Building, Room 221B**

**(Cookies and coffee are served from 10:00 am)**