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## “Ultrafast control over electrons - in free space beams, inside of matter and at needle tips”

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場 所: 理学部1号館913号室+ZOOMでの開催(事前登録制)

### 【Abstract】

Optical fields and electrons can be efficiently coupled. We show three experiments in which we could gain new insights and reach new levels of electron control by focusing ultrashort, often phase-controlled few-cycle pulses at (1) photonic nanostructures for electron acceleration, (2) graphene and (3) sharp needle tips. (1) With properly designed quasi-periodic nanostructures, we could demonstrate complex electron phase space control at optical frequencies. This allowed us to guide and accelerate electron bunches through the 225nm narrow channel of a 500μm long nanophotonic accelerator structure, obtaining an energy increase from 28 to 40 keV. (2) In graphene and at the graphene-gold interface, we could demonstrate strongfield coherent electron dynamics, allowing us to show a first logic gate potentially operating at petahertz frequencies. (3) At sharp needle tips, we can now perform precision attosecond physics measurements. For example, we measured the electron emission with an error bar as small as 30 attoseconds. Last, I will show chip-based guiding of electrons, resulting in novel low-energy electron resonators.

使用言語 : 英語 (English)

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申込方法 : Google forms(下記)にて参加の申し込みを行ってください。

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