Tajima Group

Plasma @ UCI Physics

for visiting graduate students for AY2021

1. Laser Wakefield Accelerator (LWFA)
2. Fusion Reactor (Field Reversed Configuration)

History of Wakefield Acceleration and UCI

Tajima, Rostoker, Mako, ~1970's: collective acceleratio (at UCI)

Tajima and Dawson, PRL, 1979: wakefields

Tajima, M. Cavenago, PRL, 1987: crystal acceleration

S. Iijima, Nature 1991: CNT

Tajima workshop invited Iijima, 1992

Nakajima,…Tajima: First LWFA experiment, 1994

Mourou, 2014: Thin Film Compression

Tajima, 2014: nanotube acceleration with X-ray (UCI)

Zhang, 2016: self-focusing in nanotube (UCI)

Shiltsev, Tajima, 2019: Fermilab workshop (UCI)

flat snow → half-pipe snow

(flat plasma) (nanotube, see next page)

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www.worldscientific.com
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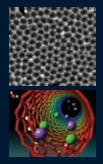
Shiltsev • Tajima



BEAM ACCELERATION IN CRYSTALS AND NANOSTRUCTURES

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Edited by

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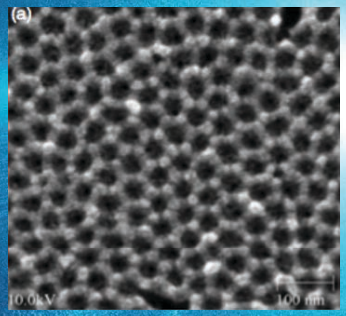
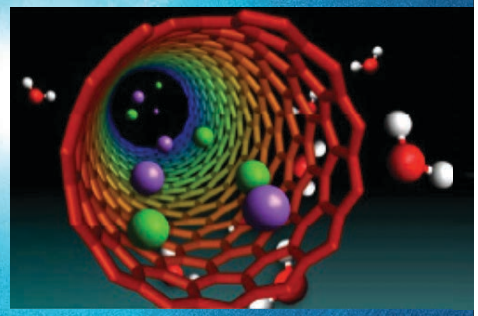




Many nanoholes Single nanohole

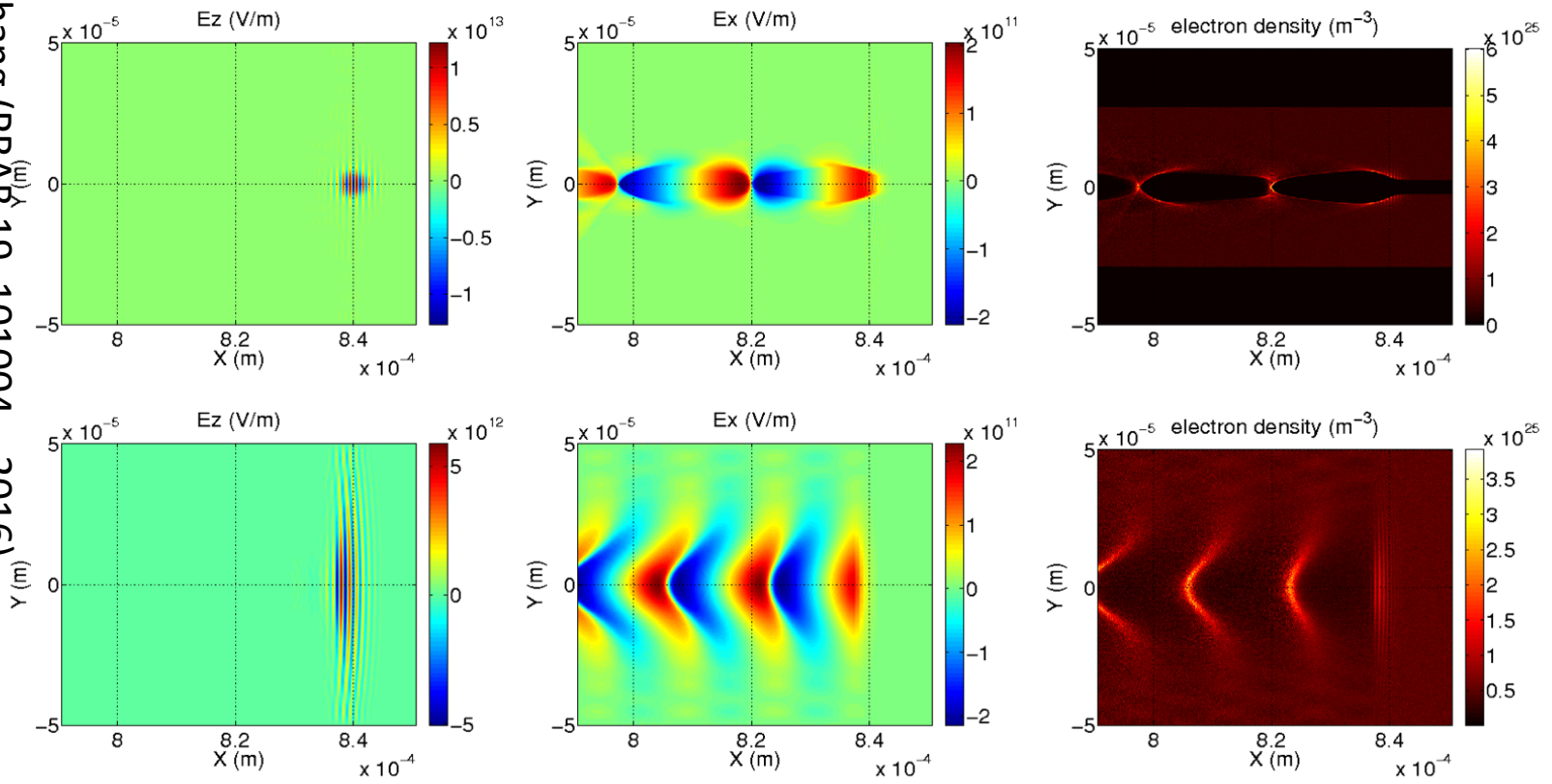
World Scientific

Book published (2020)

Gathered for **nanotube wakefield acceleration** (Fermilab, 2019)

X-ray LWFA in nanotube vs. uniform

X. Zhang (PRAB 19, 101004 , 2016)



in nanotube

in uniform solid

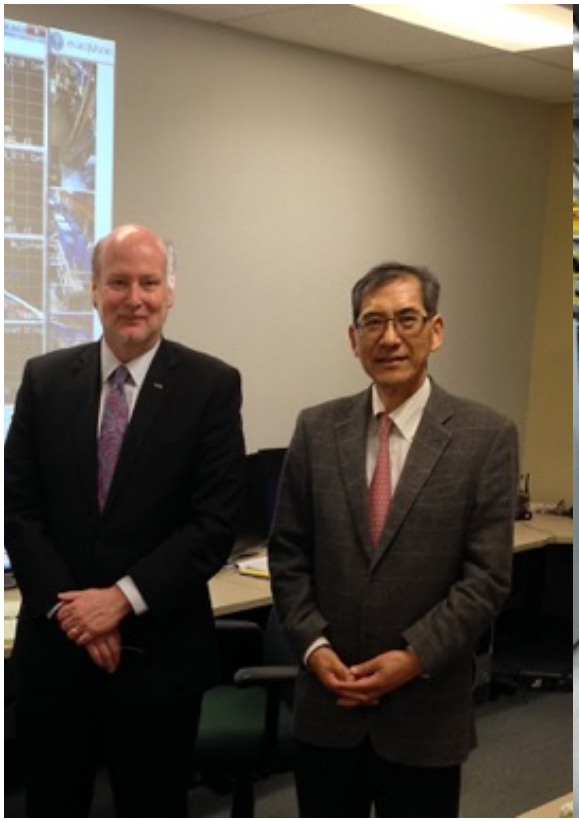
A few-cycled 1keV X-ray pulse (a_0 ~ O(1)), causing 10TeV/m wakefield in the tube

more strongly confined in the tube cf: uniform solid

Our new vision: Marriage between **LWFA** and **Nanotech**

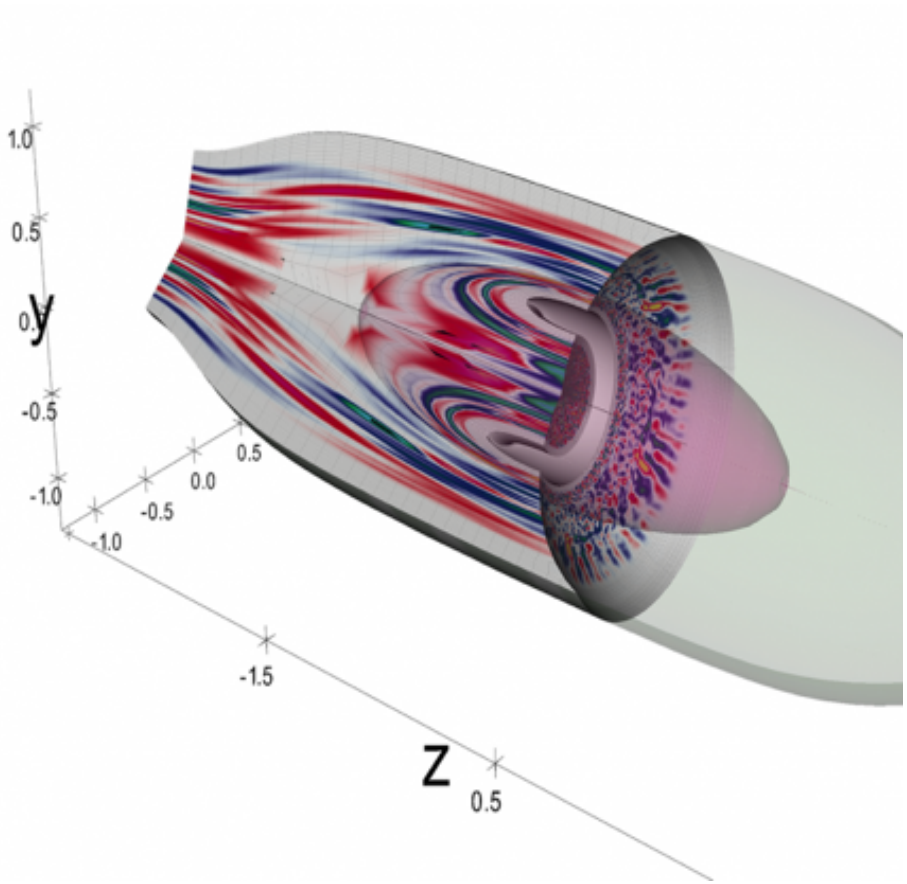
Fusion Machine “Norman”

Field-Reversed Configuration (FRC) Plasma



Chancellor visits lab

With **US Representative**
Mr. Mark Takano
(at Norman, TAE)



Exascale Computing Project (ECP)
of FRC plasma under US DoE