

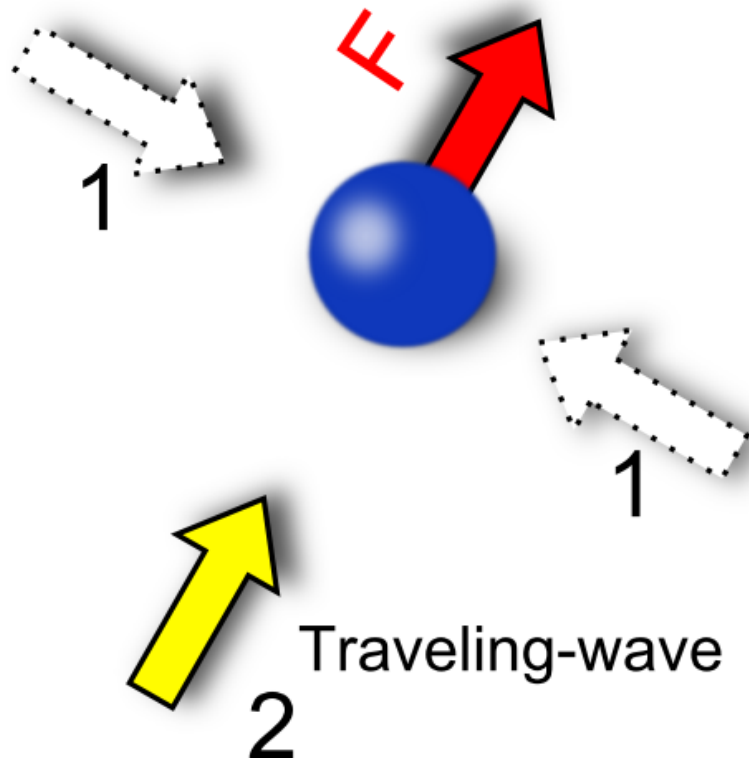
# 光で操るナノ物質のマクロな運動

- 非線形光学効果による光マニピュレーション

# 誘導反跳力

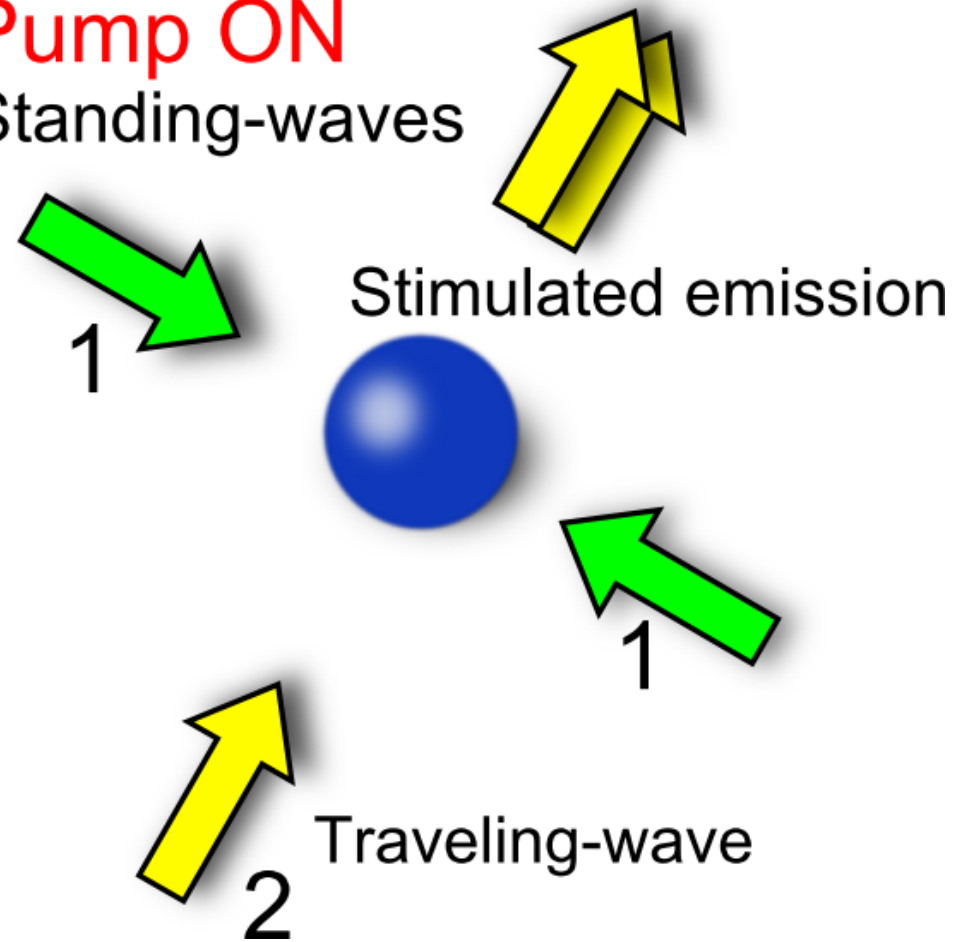
Pump OFF

Standing-waves

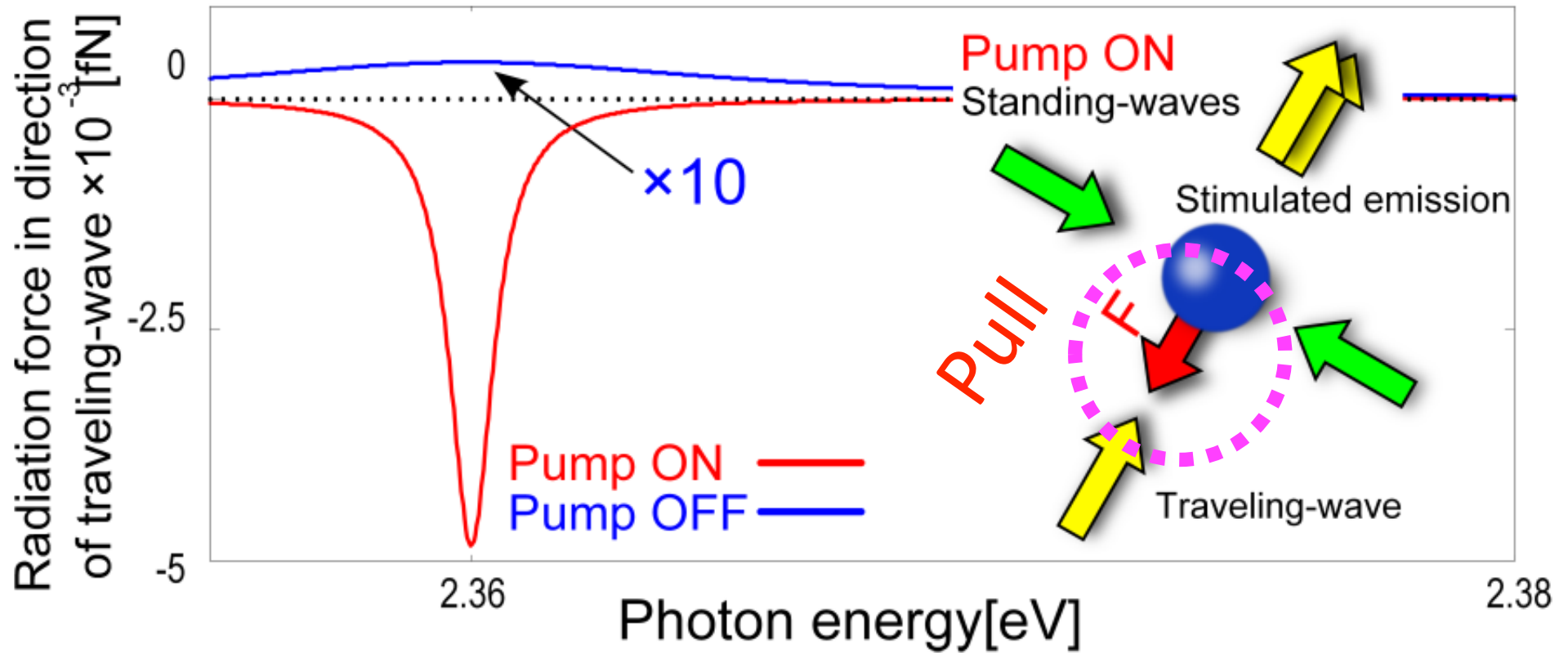


Pump ON

Standing-waves

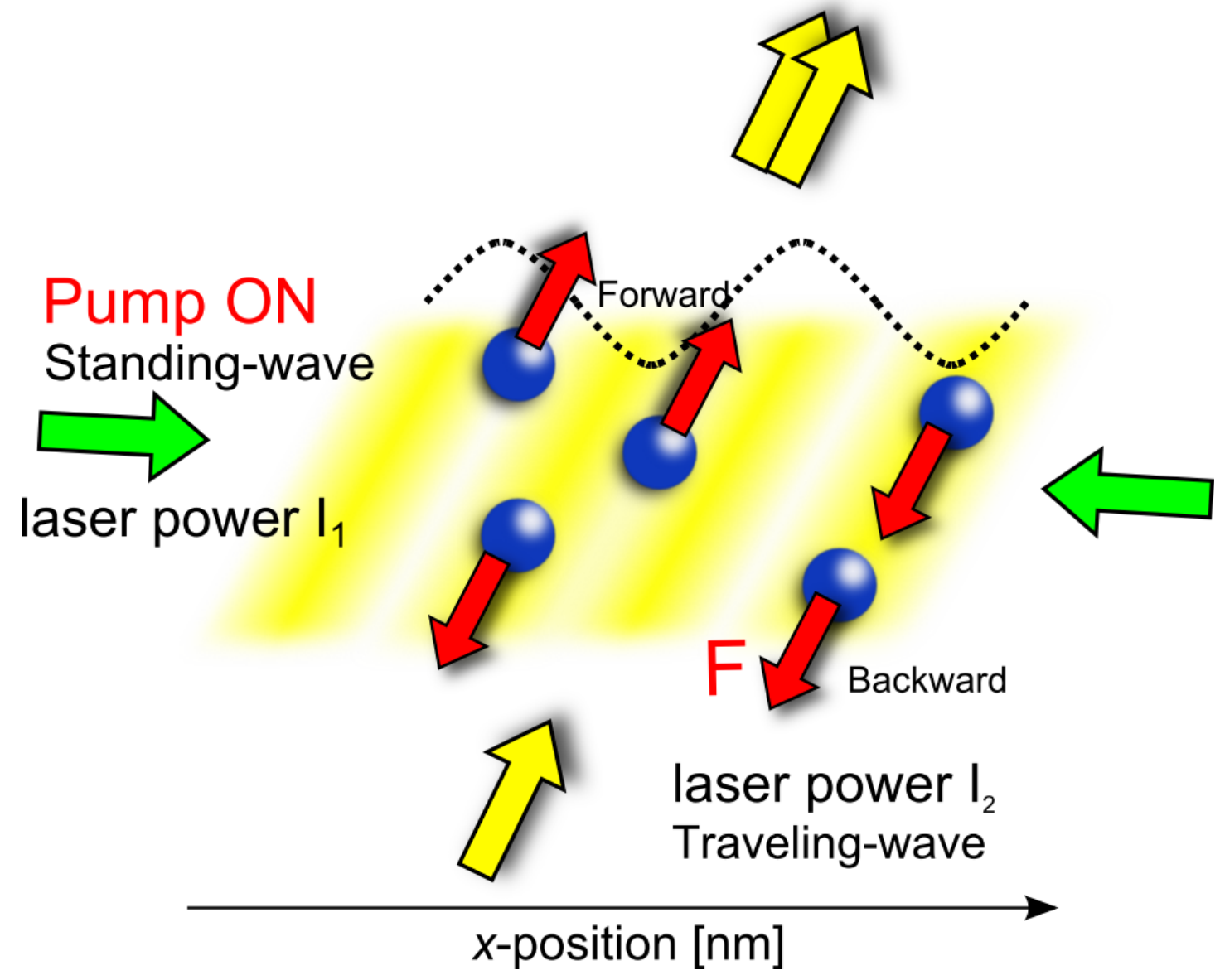


# 誘導反跳力



誘導放出に伴い、  
通常とは反対に力が働く

# Application of stimulated recoil force



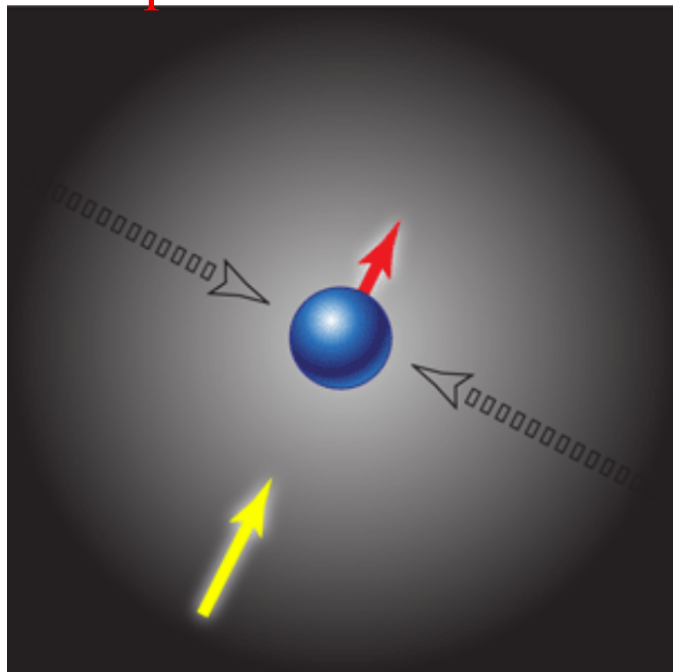
# Stimulated recoil force

T. Kudo and H. Ishihara, Phys. Rev. Lett. 109, 087402 (2012)

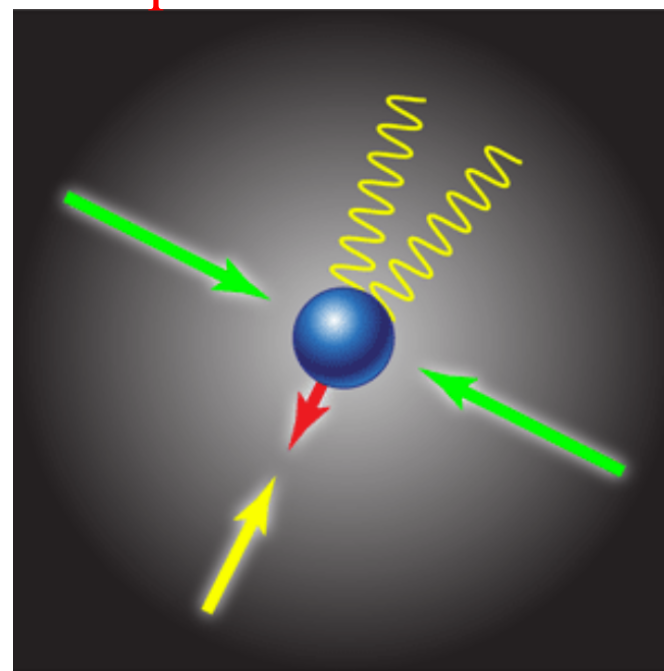
## Focus: How to Manipulate Nanoparticles with Lasers

Published August 24, 2012 | Physics 5, 95 (2012)

Pump off



Pump on



APS/Alan Stonebraker

Laser pair makes a strong nanotweezer. A proposed new kind of “optical tweezers” traps nanoparticles where two laser beams overlap. (Top) After the first laser beam (green) excites the nanoparticle, a second laser beam (yellow) stimulates deexcitation, with the recoil from photon emission generating an effective pulling force (red). (Bottom) When the first laser is turned off, there is no excitation, and the second laser beam pushes the nanoparticle (red).

# まとめ



## ● 量子力学と共鳴光マニピュレーション

個々のナノ構造の量子力学的個性の選別

量子ドット、CNT、キラル選別、輸送実験、プラズモントラッピング

## ● 非線形共鳴光マニピュレーション

集光ビームによる分子トラップ実験を説明

高エネルギー側捕捉、共鳴アシスト

非線形応答を用いた新しい光マニピュレーションの提案

誘導反跳力

