



ASSOLOMBARDA  
Confindustria Milano Monza e Brianza

# COATING INORGANICI FUNZIONALI NANOSTRUTTURATI

Speaker

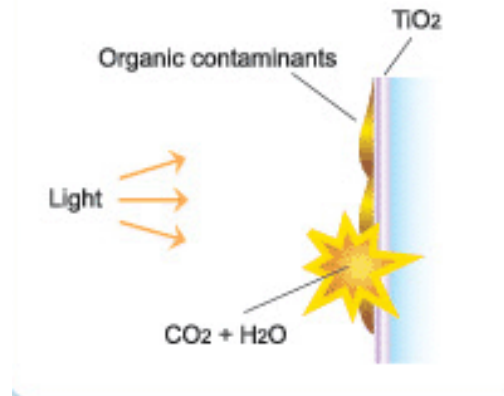
Carlo S. Casari

30 novembre 2016

## Materiali per l'Energia



## Superfici funzionali



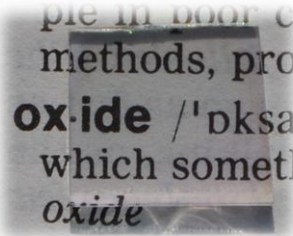
## Coating protettivi



**Morfologia controllata**  
**Alta superficie efficace**



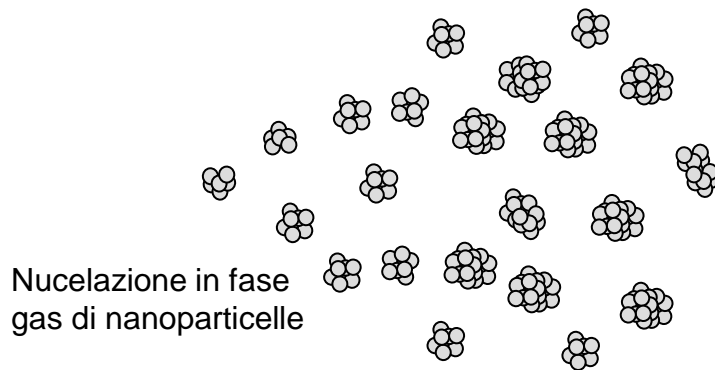
**Ingegnerizzazione**  
**delle proprietà**



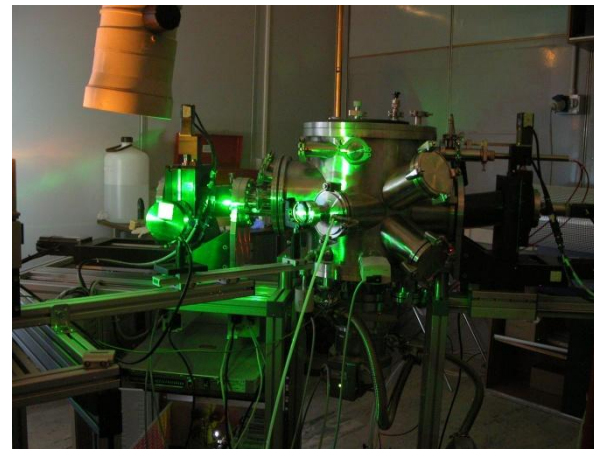
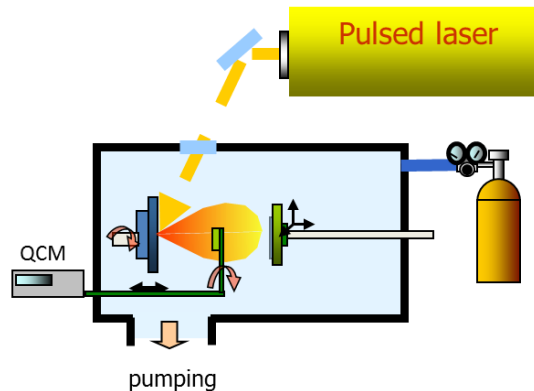
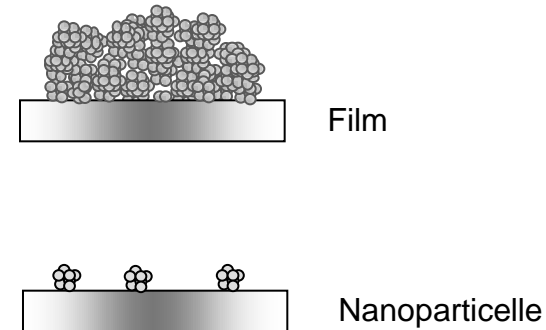
**bassa temperatura**  
**di processo**



## Sintesi di nanoparticelle



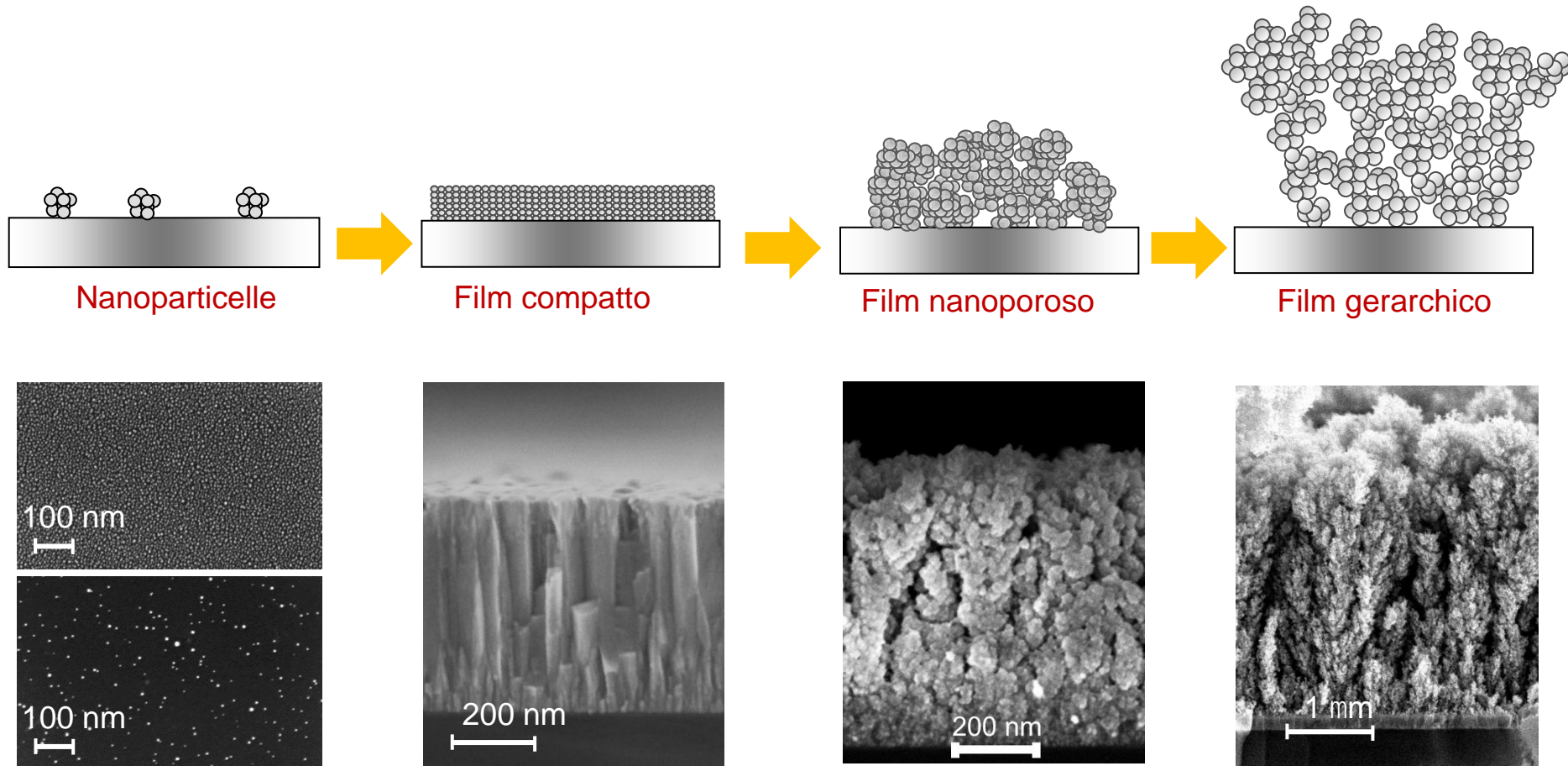
## Deposizione di nanoparticelle



Ablazione Laser Pulsata

# Dalle nanoparticelle ai film gerarchici

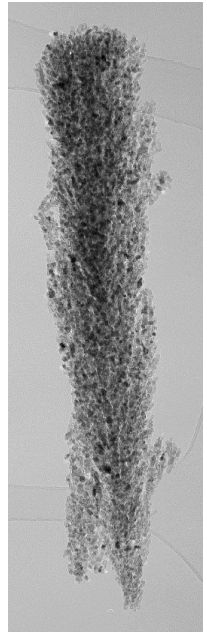
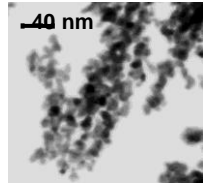
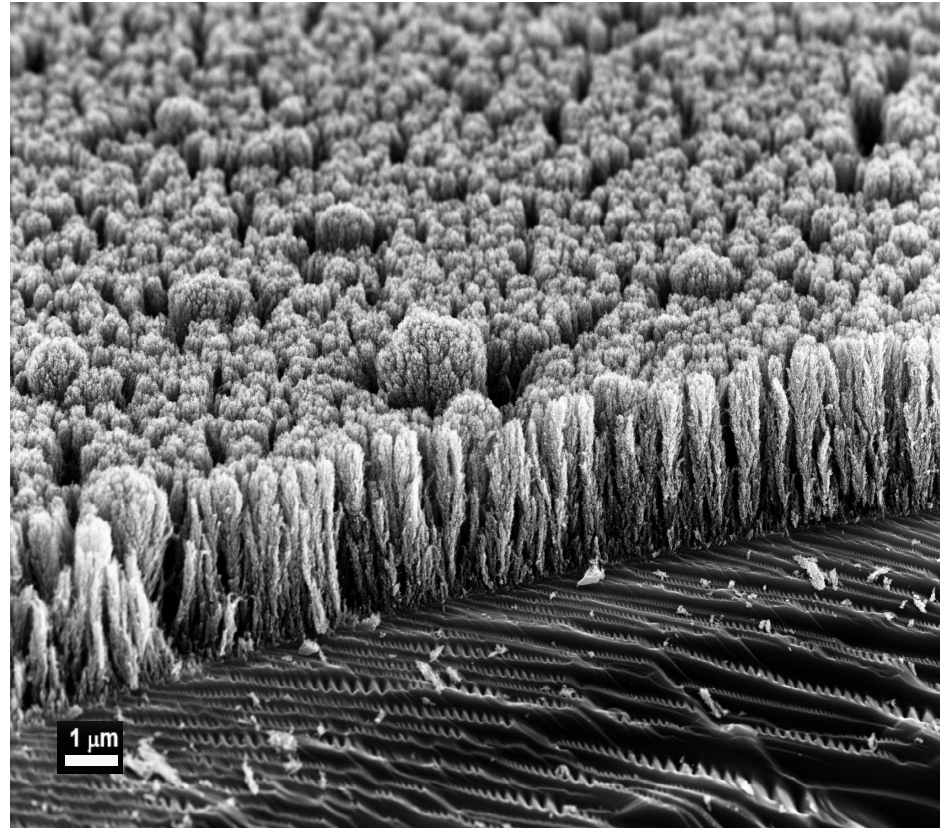
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# Esempio: una micro-foresta di nano-alberi

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## Metalli

Ti, Pd, Au, Ag, W

## Ossidi

$\text{TiO}_2$ ,  $\text{Ag}_4\text{O}_4$ ,  $\text{WO}_3$ ,  
 $\text{ZnO}$ ,  $\text{Al}_2\text{O}_3$

## Carbonio

carbonio amorfo,  
carbon wires

## Semiconduttori

Si,  $\text{Bi}_2\text{Te}_3$

## Ossidi drogati

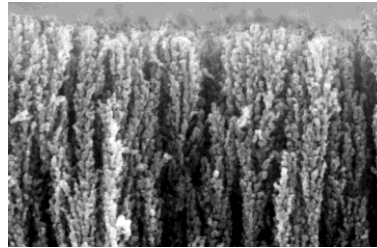
$\text{Ta:TiO}_2$ ,  $\text{Al:ZnO}$

# Quali Applicazioni?

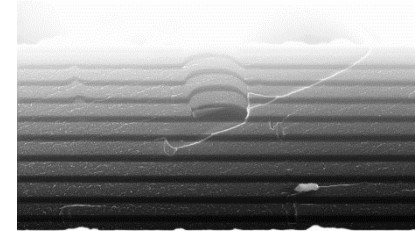
7



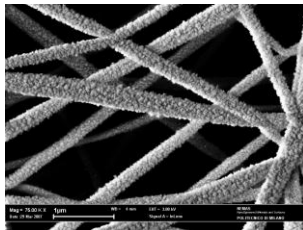
Film flessibili



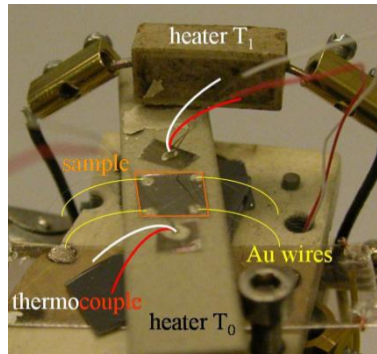
Water splitting



Multilayer protettivi

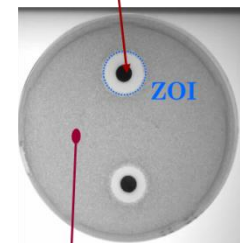


Fibre/Tessuti



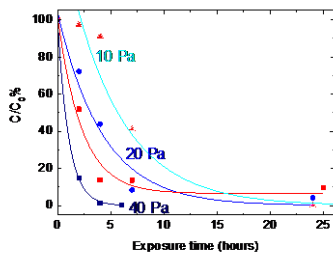
Film termoelettrici

$\text{Ag}_4\text{O}_4$  on cellulose disks

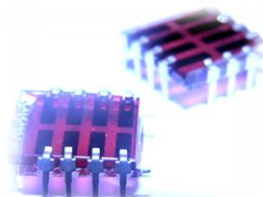


Bacterial colony (E. Coli)

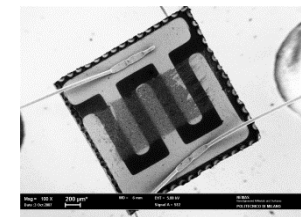
Antibatterico



Sup. Autopulenti



Fotovoltaico



Sensori di gas





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**Dipartimento di Energia**  
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