

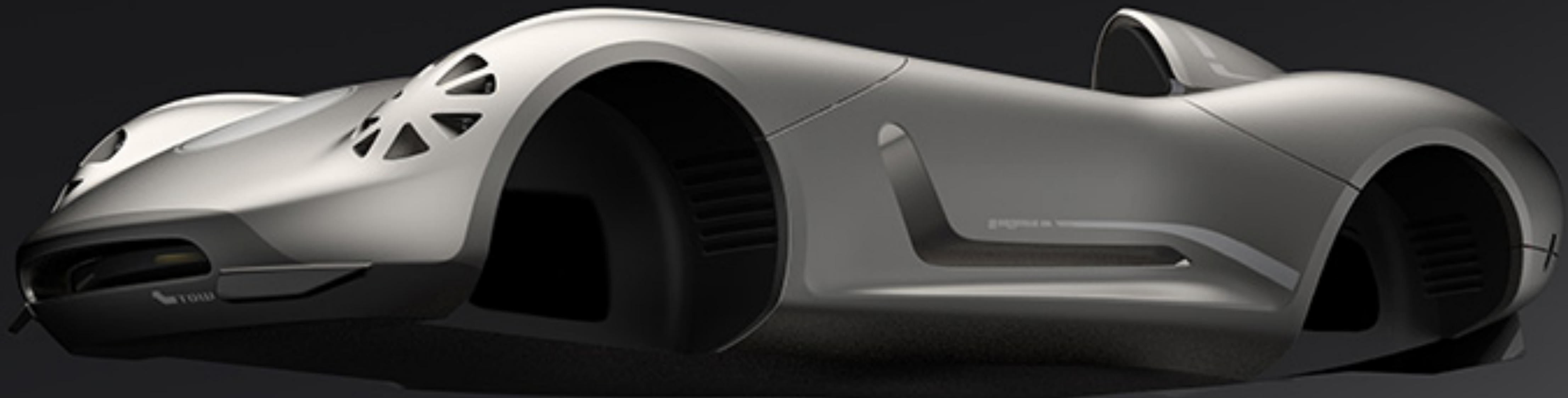
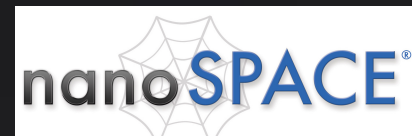
Czech nanotech products in the automotive industry, present & future

JIŘÍ KŮS

Czech Nanotechnology Industries Association



EuroNanoForum
2019



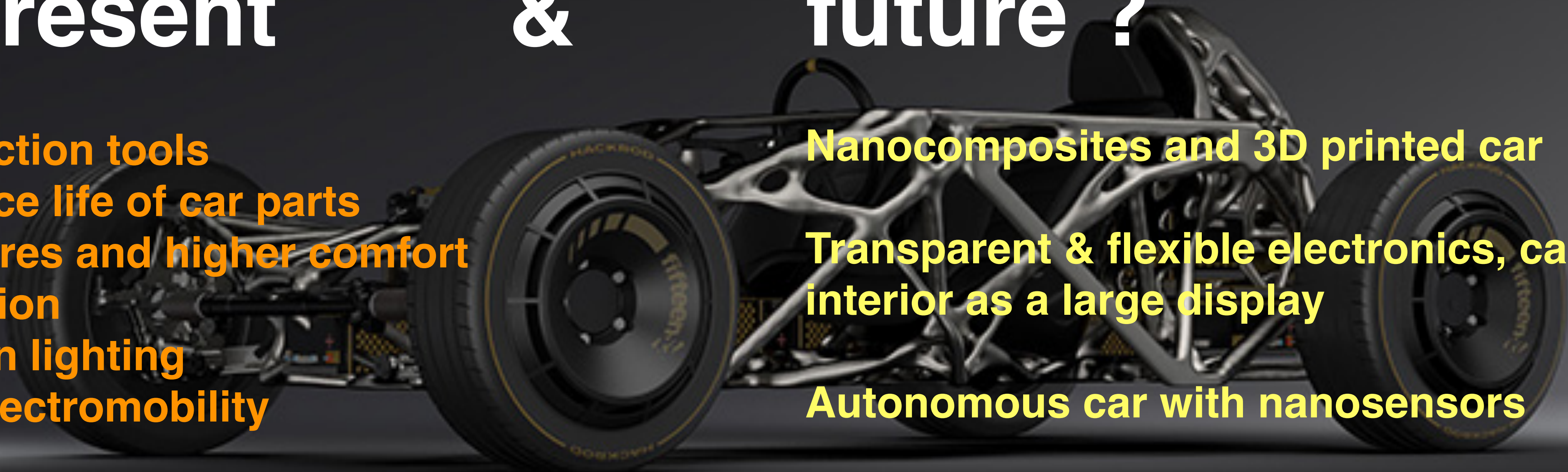
present

&

future ?

Better production tools
Longer service life of car parts
Special features and higher comfort
Theft protection
Nanooptics in lighting
Battery for electromobility

Nanocomposites and 3D printed car
Transparent & flexible electronics, car interior as a large display
Autonomous car with nanosensors



SUPER HARD AND SUPER SLIPPERY TOOLS FOR CAR INDUSTRY

Dedusted atoms after bombarding by accelerated ions under high vacuum impinge on the surface and form new material

Because the material is almost atom-atom-bound, it is very homogeneous and without major crystalline defects

Acc.V	Spot	Magn	Det	WD	-----	1 μ m
15.0 kV	3.0	20000x	SE	8.8	904	

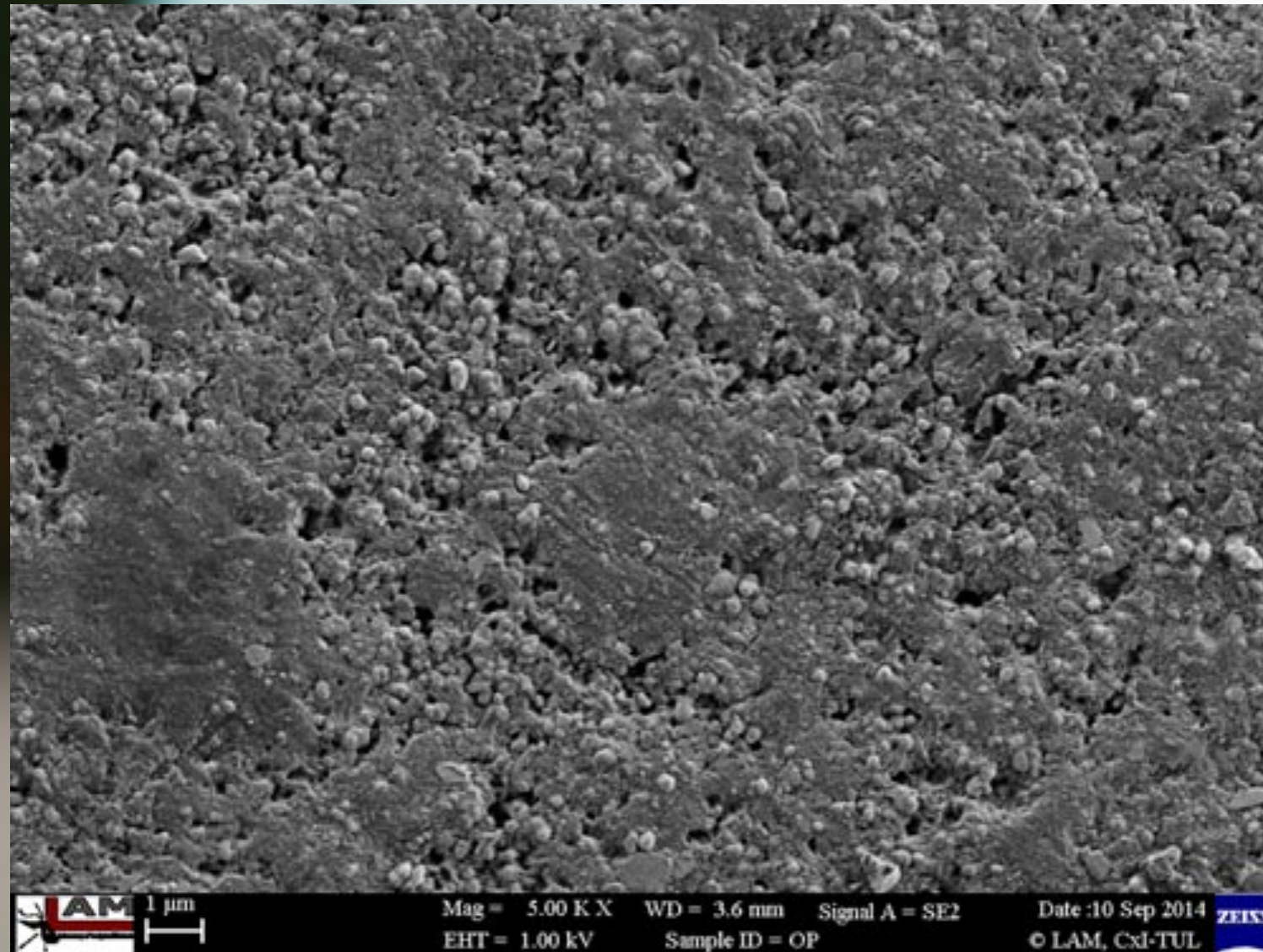
ZINC OXIDE NANOPARTICLES WILL BE APPRECIATED IN THE RUBBER INDUSTRY

The use of zinc oxide nanoparticles in the production of tires will prolong their service life and reduce production costs

CAR PAINT, GLASS AND WHEEL PROTECTION

PIKATEC[®]
NANOTECHNOLOGY & ENERGY

NanoTrade
S.r.l.

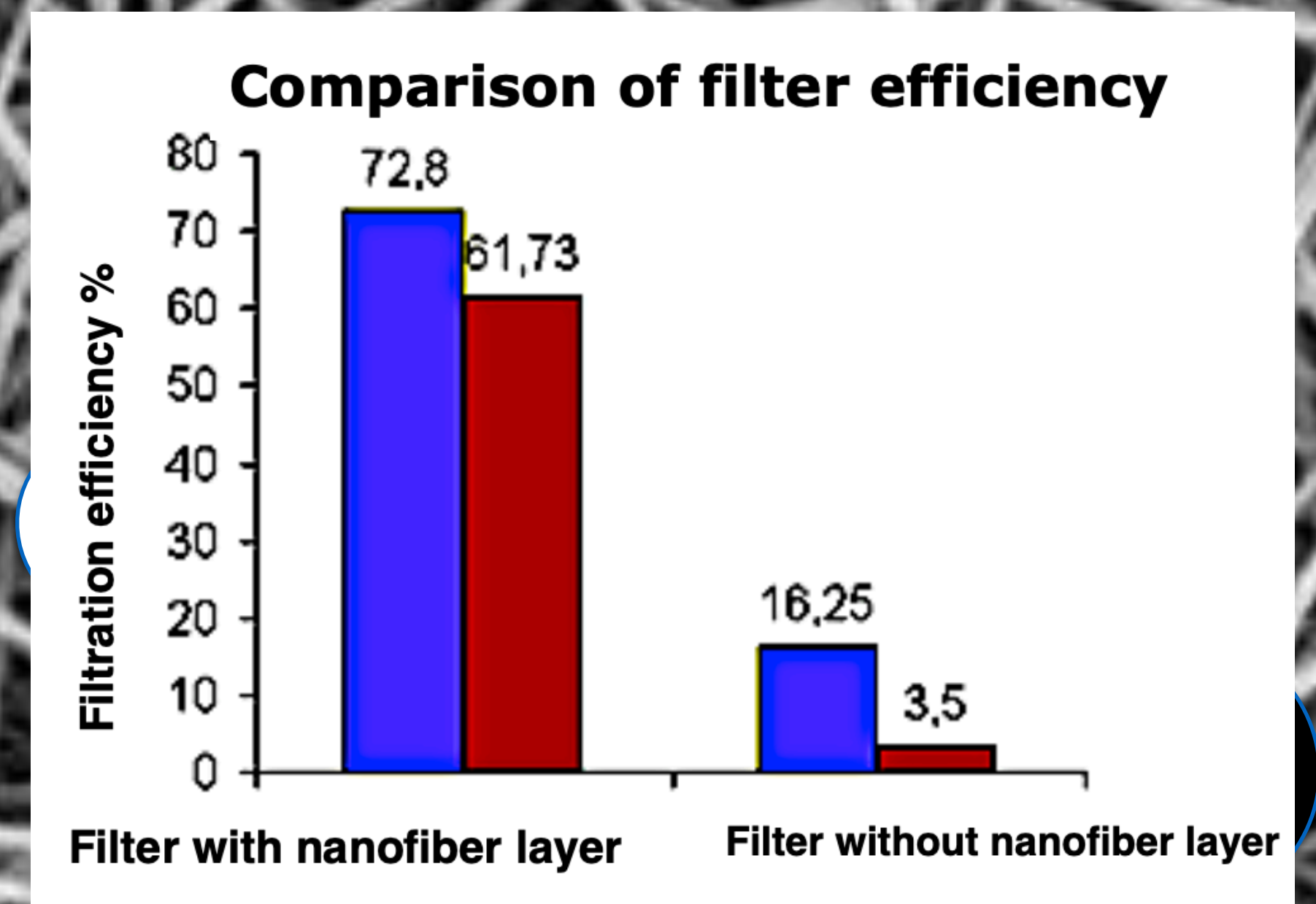


**Nanoparticles protect
the car with an
invisible shield from
scratches and deep
contamination**

2 μm, EHT = 5.00 kV, Mag = 10.00 K X, Signal A = AsB, Date :4 Sep 2015, LAM, CxI, TUL, ZEISS, Signal B = SE2, Signal = 1.000, Lukas Volesky



SPECIAL CAR FILTERS WITH NANOMEMBRANE



Nanofibers filled with molecules of silver and placed in carbon fiber composite for capture and elimination of particulates, bacteria, allergens and smells

CARS FOR ALLERGY SUFFERERS



Car upholstery and anti-allergic pads with nanofiber membrane can prevent the penetration of mites and their allergens



IQ
STRUCTURES

PROTECTION AGAINST THEFT AND FORGERY

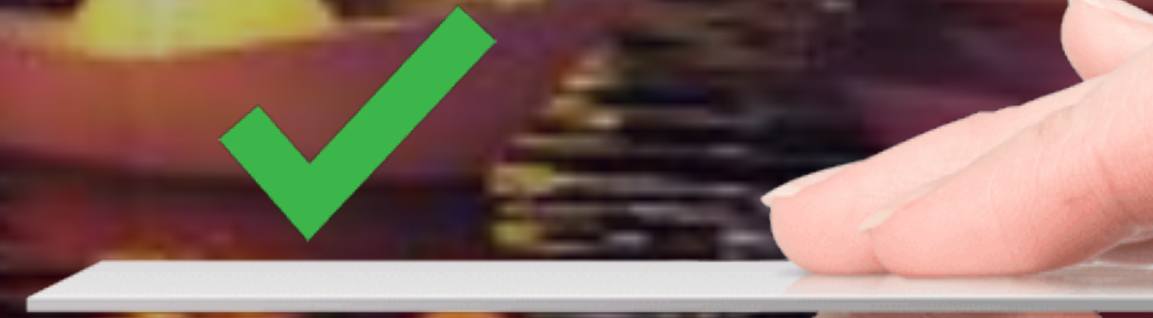
Invisible nanodots increase the chance of finding a stolen car and punish thieves

NANOOPTICS IS SHAPING THE CAR LIGHT

Replace large lenses and reflectors, and create smaller and thinner designs

Nanooptics provides perfectly homogeneous illumination of surfaces or objects, and offers unprecedented possibilities for shapes and light distribution

Nanooptics can will reduce production costs and car weight



REVOLUTIONARY 3D BATTERY IS 100% SAFE



Due to lower internal resistance, robust separators and the absence of any organic materials (except for the electrolyte) HE3DA cannot burn or explode due to a short circuit

Battery system capacity up to 500 Wh/liter

Kilowatt hour module offers fifteen times higher peak power than currently used technologies

Efficiency above 95%

Lifespan 5000 cycles



THANK YOU FOR YOUR ATTENTION!