Order in one dimension: Functional hybrids of chirality-sorted carbon nanotubes

Fact Sheet

Project Information

ORDERin1D

Grant agreement ID: 679841

Project website

Status

Ongoing project

Funded under
H2020-EU.1.1.

Overall budget
€ 1 499 425

EU contribution
€ 1 499 425

Hosted by
UNIVERSITEIT ANTWERPEN
Belgium

Start date
1 May 2016

End date
31 October 2021

Objective

The hollow structure of carbon nanotubes (CNTs) with a wide range of diameters forms an ideal one-dimensional host system to study restricted diameter-dependent molecular transport and to achieve unique polar molecular order. For the ORDERin1D project, I will capitalize on my recent breakthroughs in the processing, filling, chiral sorting and high-resolution spectroscopic characterization of empty and filled CNTs, aiming for a diameter-dependent characterization of the filling with various molecules, which will pave the way for the rational design of ultraselective filtermembranes, sensors, nanofluidic devices and nanohybrids with unseen control over the structural order at the molecular scale. In particular, I recently found that dipolar molecules naturally align head-to-tail into a polar array inside the CNTs, after which their molecular directional properties such as their dipole moment and second-
order nonlinear optical responses add up coherently, groundbreaking for the development of nanophotonics applications.

**Field of science**
/ engineering and technology/ nanotechnology/ nanophotonics
/socia sciences/ social and economic geography/ transport

**Programme(s)**

**Topic(s)**

**Call for proposal**
ERC-2015-STG

**Funding Scheme**
ERC-STG - Starting Grant

**Host institution**

UNIVERSITEIT ANTWERPEN

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**Benefits (1)**

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