

# The Italian High Tech Cluster for Nanotechnologies

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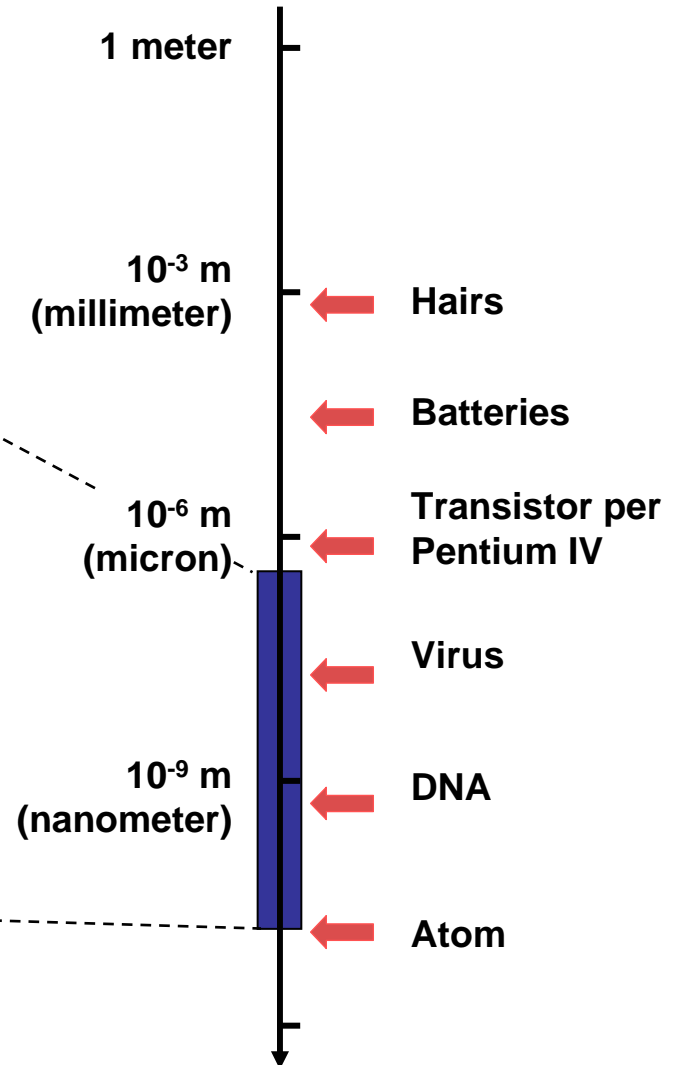
Venezia, 16 gennaio 2007

*Enzo Sisti – Investor Relations, Veneto Nanotech*  
*Raffaele Franco – Marketing Manager, Nanofab*



# NANOTECHNOLOGIES: THAT'S UNKNOWN!

**Nanotechnologies are all methods and techniques used to modify the matter on molecular and atomic scale. Their objective is building products and material with new and special chemical-physical property**



## VISION

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- ❑ In the 2003 the Italian Ministry of University and Research has chosen to relaunch the Italian industrial model, that is the industrial cluster.
- ❑ The chosen was to identify the different center of competence and to set up the *high tech clusters* as the main tool to foster innovation.

### Industrial cluster

- High concentration of company of the same sector
- Territoriality closeness of the companies belonging to the value chain
- Widespread knowledge
- High level of entrepreneurship and high level of start-up

### High tech cluster

- High concentration of researchers and notable research activities
- Existence of interdisciplinary centers of research
- Existing start ups examples in the research environment
- High industrial attractiveness

## ITALIAN HIGH TECH CLUSTERS

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- Nanotechnology – Veneto
- ICT wireless e wire-line technologies – Piedmont
- IMAST - Polymeric e composite materials - Campania
- Molecular Biomedicine - Friuli-Venezia Giulia
- Biotechnology - Lombardy
- ICT - Lombardy
- Advanced materials - Lombardy
- Intelligent Integrated systems - Liguria
- Mechatronics - Emilia-Romagna
- Aerospaziale - Lazio
- Micro and nanosystems - Sicily



*Ministero dell'Istruzione,  
dell'Università e della Ricerca*

## MISSION

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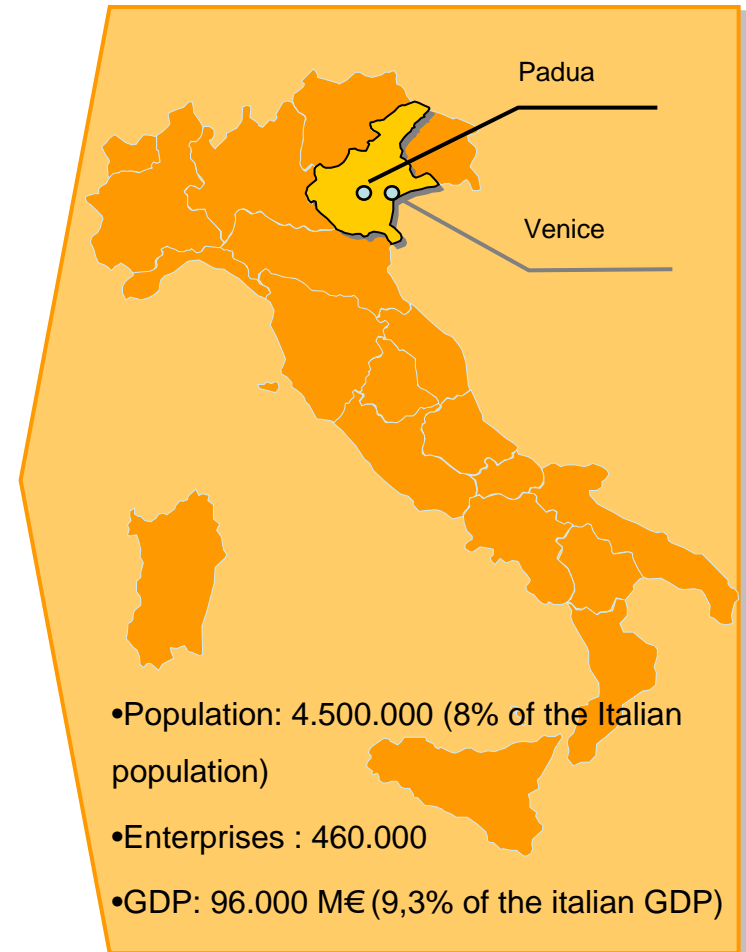
- The high potential of the Universities and the economic world fostered to appoint in Veneto *The Italian High Tech Cluster for Nanotechnologies*

Increasing private investments in R&D activities

Developing international excellent R&D centers







Developing new technological entrepreneurship

- Supporting the industrial research within enterprises by managing public funding
- Fostering technological transfer through new infrastructures devoted to scientific research and to industrial experimentation
- Attracting companies and investors and promoting the birth of *start-up* through the management of seed capital funds



# RESEARCH FIELDS AND RESOURCES IN OUR CLUSTER

The map of the resources and the research themes within the Cluster, point out:

Technological segment	University Professors*	Currently trained Researchers **	Examples of applications of the research in Veneto
<b>Nanotechnologies for materials</b> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; width: 45%;">                     Nanostructures   </div> <div style="border: 1px solid black; padding: 5px; width: 45%;">                     Analysis / Models   </div> </div>	110	149	<ul style="list-style-type: none"> <li>• Coatings for selflubricating surfaces</li> <li>• Laser sources for thin films deposition</li> <li>• Micro and nanostructures non destructive diagnosis</li> </ul>
<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; width: 45%;">                     Structural   </div> <div style="border: 1px solid black; padding: 5px; width: 45%;">                     Functional   </div> </div>	79	70	<ul style="list-style-type: none"> <li>• Protection and decoration of gold and silver</li> <li>• Anticorrosive steel treatments</li> <li>• Improvement of light absorption in glass</li> <li>• Sensors for identifying and destroying pollutants</li> </ul>
<b>Nanoelectronics</b> 	6	11	<ul style="list-style-type: none"> <li>• Nanostructured silicon made semiconductors</li> </ul>
<b>Nanobiotechnologies</b> 	65	90	<ul style="list-style-type: none"> <li>• Artificial substitutes of skin, cartilages, vessels and bones</li> </ul>
<b>Totale</b>	<b>260</b>	<b>320</b>	

\* Full professors or equivalent, associated professors or equivalent, researchers

\*\* Doctorands, research fellows, collaborators

# THE MAIN PLAYERS

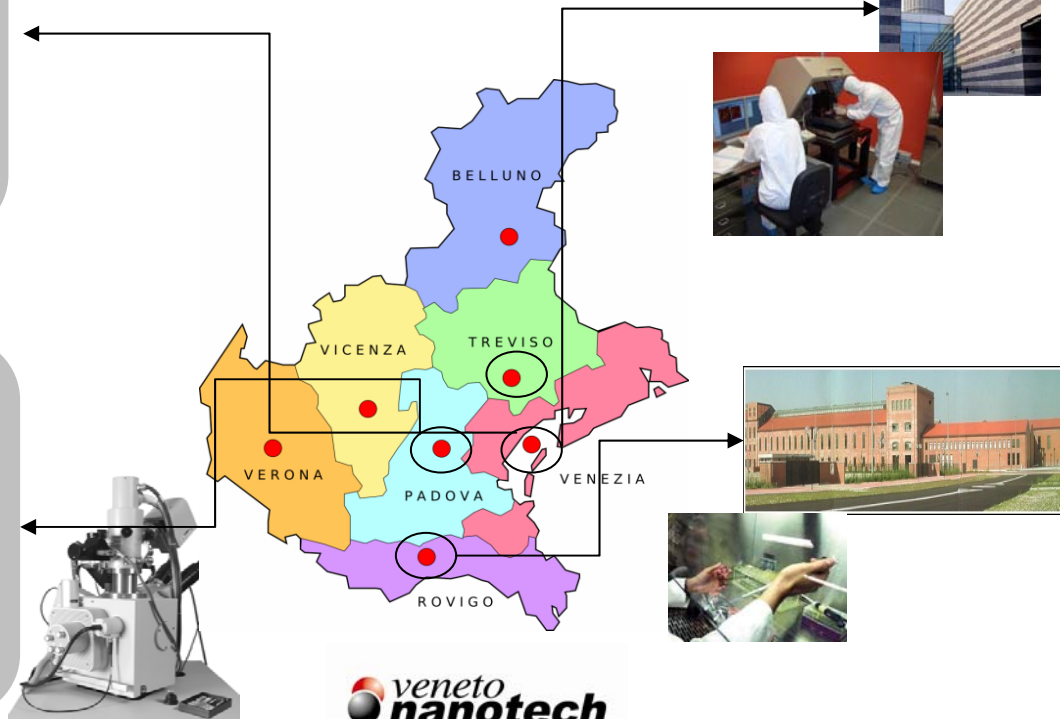


## CIVEN

Association founded in March 2003 by the three Universities of the region aiming at fostering applied research and educating in the nanotechnologies sector  
[www.civen.org](http://www.civen.org)

## LANN

Centre for the nanofabrication of all electronic devices. It works at a higher level of theoretical research and it is focused on nano-treatment



## NANOFAB

Laboratory of applied research focused on technology transfer towards private enterprises and on the development of nanostructured prototypes  
[www.nanofab.it](http://www.nanofab.it)

## ECSIN

Center for the study of the impacts of nanotechnologies on human health, environment and society based in Rovigo.  
[www.ecsin.eu](http://www.ecsin.eu)



## MAIN ACTIVITIES

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### Management

- Strategic coordination
- Public fund management
- Marketing development
- Investment attraction
- Fund raising

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### CIVEN/NANOFAB



### Research & Technology transfer

- Thin Films
- Nano sensory
- Nanopowders
- Micro-array and products designed for drugs and vaccines delivery

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### ECSIN



### Risk assessment

- Interaction of nanotech products with the environment, health, society
- Control of the non-noxiousness of industrial environment involved in the production of nanostructures

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### LANN



### Nanofabrication

- Sensors for the integration micro-nano in the electronic devices
- Scanning Electronic Microscope with possibility of realization of several devices
- Nanofabrication of the matter





## BENEFITS DERIVED FROM THE CLUSTER FOR NANOTECHNOLOGY

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### Added value



#### Enterprises

- High level technology transfer
- Leverage on obtained results, even for the innovation of traditional businesses
- Availability of a wide and efficient park of technological and managerial talents
- Access to opportunities of co-financing for industrial projects

#### Researchers and potential entrepreneurs

- Laboratories for developing ideas
- Support for creating and developing start ups
- Concentration of researchers/universities (networking)

#### Territory

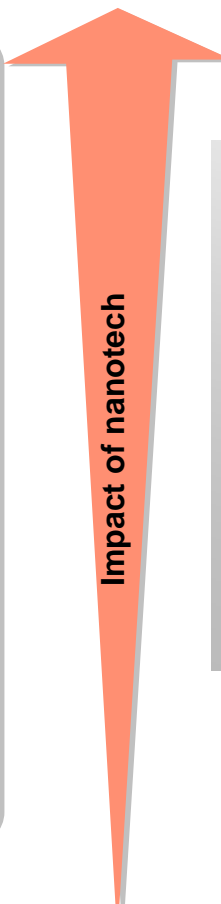
- Development of an entrepreneurial culture
- Attractiveness for excellent external talents and businesses
- Image redefinition (industrial, hi-tech)

# INDUSTRIAL APPLICATIONS OF NANOTECHNOLOGY

Many Italian companies are investing on nanotechnologies to develop a strong product innovation to compete with Asian low price strategy

**Why NN?**

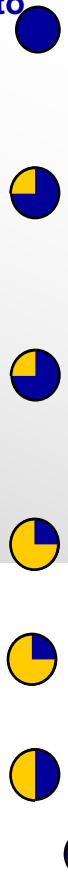
- High competitive pression and need of innovation
- Loss of competitiveness of traditional sectors committed
- High impact of nanotechnologies on development of new product
- High potential of integration of nanobiotech



## Industries

- Metal materials
  - Production of metals and alloys
  - Fabrication and manufacture of metal products
  - Productions of machines and mechanical equipment
- Textile, clothes and fashion:
  - Fabric industry
  - Clothing industry
  - Leather dressing and tanning
- Non-metal materials:
  - Chemical products and synthetic fibers
  - Rubber objects and plastic materials
  - Nanostructured glasses and thin films
- Electronics:
  - Computers
  - Electronic machines and devices
  - Radio, TV and communication set
- Bio-pharmaceutical:
- Instruments:
  - Medical equipment
  - Precision devices

## Concentration in Veneto



## OTHER ACTIVITIES: MASTER IN NANOTECHNOLOGY....

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Within the Cluster, CIVEN educational and training offer includes:

- **The International Master on Nanotechnologies**, IMN, second level master, highly specialized and applied to graduated in scientific subjects
- **Short courses on nanotechnologies** for enterprises

**General  
information**

**Opportunities  
for Enterprises**

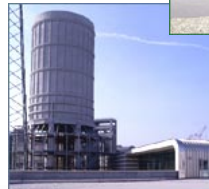
### Characteristics

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- 3 months internship
- International participants
- 3° edition

*Professional formation for enterprises means verifying the available technics and processes and the applications of nanotechnologies:*

- Participation of business employees to single master courses
- Chance to sponsoring scholarships on thematics close to their own productive sector



*Alcune aziende partner per intership*

intel®



IBM

LIQUIDMETAL



veneto  
**nanotech**  
small technology, big applications

## ..... AND SEED CAPITAL INVESTMENT (NANOCHALLENGE)

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- Nanochallenge is the first business plan competition on nanotechnology organized in Europe
- The winner, will be award a prize as seed capital investment of € 300,000 for the creation of a start-up focused on nanotechnology
- Veneto Nanotech support all teams in defining the business plan, founding 2° round investors, an developing a strong marketing strategy for italian and european market
- In-kind service for free:
  - ✓ 1 year of free incubator services
  - ✓ 1 year free access to Nanofab
  - ✓ 1 year free web-site & hosting
  - ✓ 1 year free accomodation for 2 people
  - ✓ 1 year in-kind consulting service



The poster features a blue background with a molecular structure and a microscope. The text is as follows:

**n**anochallenge

**INTERNATIONAL  
NANOTECHNOLOGY BUSINESS PLAN COMPETITION**

**2006**

**Don't keep your idea at a nano dimension  
Start it up!**

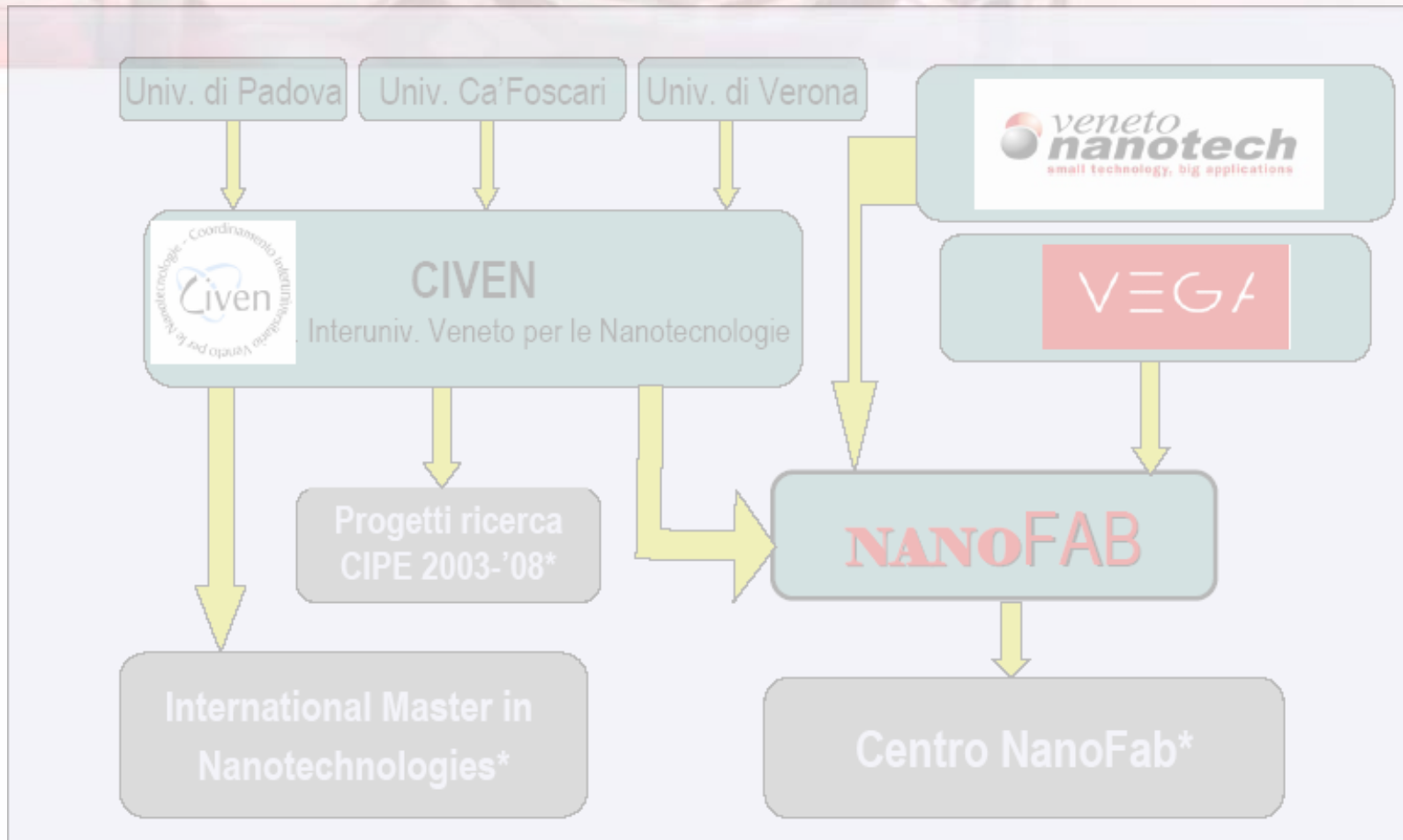
**€ 300.000 GRAND PRIZE**

For information: [www.nanochallenge.com](http://www.nanochallenge.com) - [info@nanochallenge.com](mailto:info@nanochallenge.com)

# NANOFAB s.c.a.r.l.

- Shareholders: *VEGA Scarl, Venice's Scientific-Technological Park*
- *CIVEN, the Veneto universities' association for nanotechnology*
- *Veneto Nanotech, the Nanotech District coordination company*
  
- Financial support: *European Union, Veneto Region, VEGA*
  
- Funding: *20 million Euros for infrastructure, equipment and research projects*
  
- Mission: *Applied research with a view to technological transfer to enterprises in Veneto*





# Scientific Know how and technical specializations

Nanofab scientific equipe is composed at the moment by 12 researchers with interdisciplinary technical competences focussed to develop **solutions and prototypes** addressed to the committments technical requests.

- Nanostructured coatings:** *protective, anticorrosion, anti wear, superidrophobic*
- Sintered Metallic Materials:** *gears and components with increased mechanical properties*
- Nanocomposite Polymers:** *better thermo-mechanical and gas barrier properties*
- Chemical and bio-chemical Sensors:** *environmental control*
- DNA Microarrays:** *diagnostic tools for patogenic monitoring*
- Innovative surface treatments by atmospheric plasma (in progress):** stainless tessues with good dimensional stability, waterproof and breathable leathers

# NANOFABRICATION FACILITY

## • PREPARATION AND COATINGS LABORATORIES

- Vacuum coating lab (PECVD, PVD)
- Chemical preparation lab (e.g., sol-gel surface treatment)
- Metallic powder high velocity compaction (HVC) and sintering lab
- Laboratory for the production of microarrays
- Polymer lab for thermoplastic and thermosetting nanocomposites

## • CHARACTERISATION LABORATORIES

- Tribology and metallography lab
- Compositional e spectroscopic analysis lab
- Scanning probe microscopy lab (STM, AFM)
- Calorimetric e thermogravimetric analysis lab
- Electrochemical and microelectronic analysis
- Biological analysis of genetic material

## • CLEAN ROOMS

- One class 100 clean room for nanobiotechnology
- 1 class 1000 clean room for atomic force microscopy
- 1 class 10000 clean room for analysing microarrays





## CONTACTS

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### **NANOFAB**

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*30175 Marghera – Venice/Italy*

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