The Nanotechnology Lab LTFN established in 1991, at the Aristotle University of Thessaloniki (AUTh), is an internationally acknowledged specialist in Organic Electronics (OEs) and Photonics, Thin films, Nanomaterials and Nanoengineering Technologies, Nanomedicine, 3D Printing and 3D Bioprinting, Nanometrology, In-line precision Metrology, Quality Control of Processes, Automation, Additive and Digital Manufacturing.

On 2014, LTFN established the COPE-H (Center of Organic & Printed Electronics - Hellas) for cutting-edge Research and Manufacturing of OE devices for applications in Energy, Lighting, Electronics, Buildings, Automotive, Nanobiomedicine, Wearables, Internet of Things (IoT), IoP, Smart Packaging, Greenhouses, etc.

LTFN has strong interaction and links with Academia, Research Organizations and Industry. It offers Open-Access services to interested entities (Academia, Research, Start-Ups, SMEs, Industries) and acts as a One-Stop-Shop to companies for Technology transfer, Proof-of-concept, Incubation, Skills development, Ecosystem building and Access to Funding opportunities.

LTFN with numbers

- 35 Researchers
- 7 Technicians & Support
- 2000 m^2 of Lab space
- >100 affiliated labs and clusters
- >100 completed research projects
- 8 active research projects
- 26 Chapters & Books
- >300 high impact publications
- 5 patents
- 3 spin-out companies
- >30 workshops/conferences organized

Research Fields

- Organic Electronics & Photonics
- Thin Films & Nanobiomaterials Technology
- Nanoengineering & Surface Engineering
- Nanomedicine & Nanobiotechnology
- Optical Technology, Precision Nanometrology, Quality Control & Automation
- Nano-Manufacturing, Additive & Digital Nanomanufacturing
- 3D Printing & 3D Bioprinting
- Computational & Modeling at the Nanoscale to Mesoscale

Lab for Thin Films - Nanobiomaterials
Nanosystems & Nanometrology

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Physics Dept., Aristotle University of Thessaloniki,
54124 Thessaloniki

COPE-H facilities
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ARISTOTLE UNIVERSITY
OF THESSALONIKI

Nanotechnology Lab LTFN

Lab for Thin Films - Nanobiomaterials Nanosystems & Nanometrology

Center of Organic & Printed Electronics Hellas (COPE-H)

www.ltfn.gr

Organic & Printed Electronics

LTFN is equipped with **3 unique in the world pilot lines and clean room facilities** and develops cutting-edge technologies for the Digital Nanomanufacturing of OE devices and multiscale characterization.

R2R Pilot & Production line
Large area R2R manufacturing of OPVs, OLEDs, Sensors, OFETs onto plastics, equipped with **Ultra-fast Laser scribing and in-line metrology systems**.
Printing (Slot-Die, Inkjet & Screen printing) | Ultra-fast Laser Patterning | Encapsulation module | Raman spectroscopy & In-line Spectroscopic Ellipsometry

Sheet2Sheet Pilot line
Hybrid printing and vacuum technologies for OE devices with encapsulation technologies and solar simulation system.

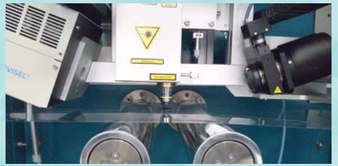
OVPD Cluster - Gas Transport Pilot line
Scalable OVPD Pilot Line equipped with in-situ optical metrology systems *(Raman Spectroscopy, Spectroscopic Ellipsometry)* for high precision fabrication of OPVs, OLEDs and sensors.

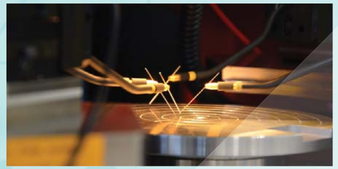
Lab Scale Printing
Wide spectrum of **printing techniques** *(S2S Gravure, Slot-Die, Inkjet, etc.)* for the Digital fabrication of OE and Bioelectronics nanomaterials, devices and systems.

Ex-situ Laser System
High energy laser systems for ultra fast processes *(laser ablation, laser annealing, etc.)* for fabrication and functionalization of novel nanomaterials and nanoparticles.

Optical Technology & Nanometrology

LTFN is a world-class pioneer in Optical Technology and Nanometrology that develops in-situ, in-line and ex-situ Optical Metrology techniques and methodologies for nanomaterials, systems characterization and process optimization. Its state-of-the-art Nanometrology facilities include: *Spectroscopic Ellipsometry, Raman & Photoluminescence, Solar Simulators, X-rays Measurements, Scanning near-field microscopy (SNOM), Electrical Characterization, SPM & Nanomechanical Characterization Platforms, Luminescence & Photoluminescence, Water Vapour Transmission measurements, Contact angle measurements, XPS, AES, TEM, SEM (access)*

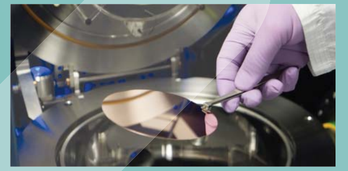




Nanomedicine & Nanobiotechnology

LTFN makes use of cutting-edge equipment and 2 Pilot Lines for nanomaterials synthesis, characterization and in vitro studies. Facilities include **cell culture, coating and 3D electrospraying deposition and Printing systems**, while a fully equipped chemical laboratory is available for nanoparticles, nanofibers and nanofilms development.

Design, development, validation and production of drug delivery nanosystems and biomedical devices, smart nanomaterials, nanoporous delivery platforms, scaffolds for tissue regeneration, nanoparticles for in vivo diagnostics, etc.



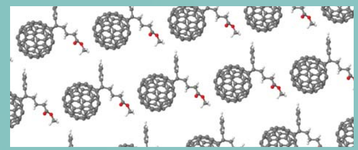
Thin films, Nanomaterials & Nanoengineering

CVD Pilot line
By the **Thermal and Plasma CVD Pilot line**, **LTFN** pioneers in Graphene and 2D nanomaterials growth in 6” wafers for cutting edge research and applications in nanoelectronics and photonics.
Real-time optical monitoring techniques (Vis-UV SE and Raman) for in-situ characterization and process optimization

2 Ultra High & 1 High Vacuum Pilot lines
State-of-the-art PVD techniques for thin film growth on 2D/3D surfaces. **LTFN** focuses on superhard and tribo-coatings, optical, plasmonic, decorative and biocompatible nanocoatings for many applications *(cutting-tools, opthalmic lenses, optoelectronics, energy harvesting and medical implants)*.

Surface & Nanomechanical characterization facilities
LTFN posseses a variety of systems *(SPM platforms, SNOM and Nanoindentation systems)* for surface and nanomechanical characterization of nanomaterials and devices.

Synthesis of Engineered Nanoparticles
LTFN has a fully equipped laboratory for chemical synthesis, laser-based fabrication and solution processing of a broad range of inorganic and organic nanoparticles for applications in OEs and Nanomedicine.



Computational & Modeling at the Nanoscale to Mesoscale

LTFN has a strong expertise in multiscale Computational Modeling from nano- to macro- to understand the growth mechanisms and properties of novel materials, materials’ behavior and/or nano-device manufacturing processes, targeting to enable the reliable large-scale manufacturing of devices and systems.

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