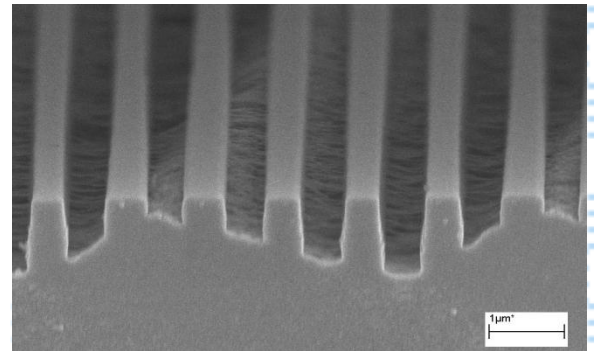
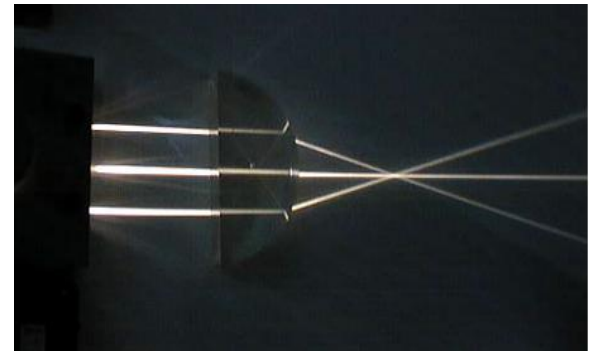




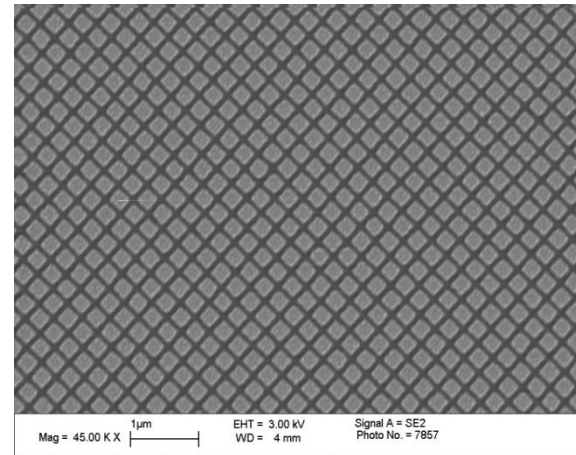
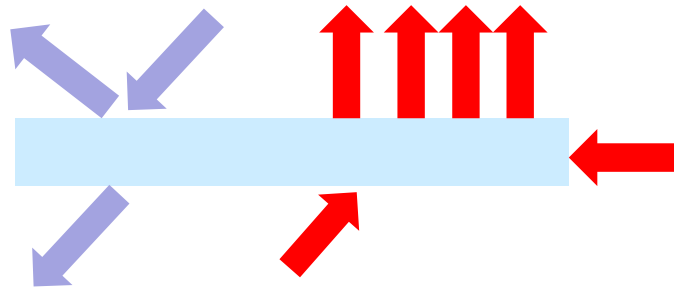
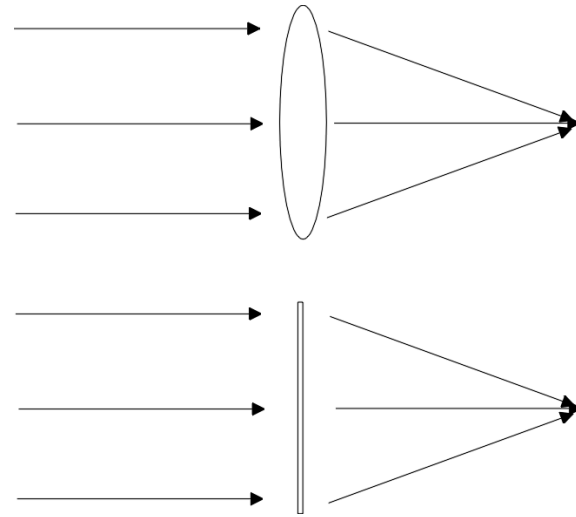
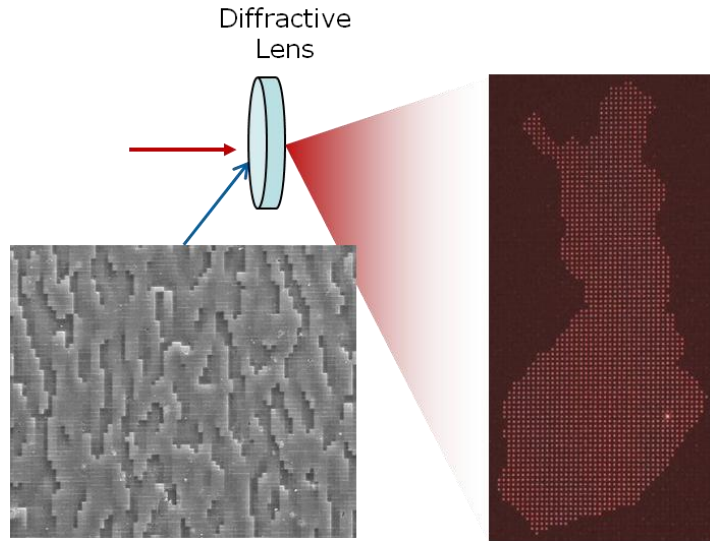
Nanocomp presentation
Photonics Roadmap for SME's
7.5.2009 Oulu
Pekka Savander
Nanocomp Ltd, FINLAND

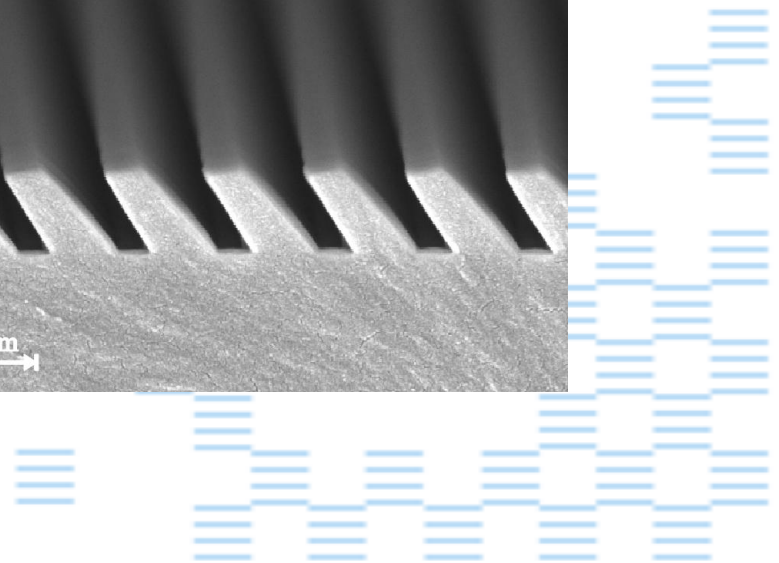
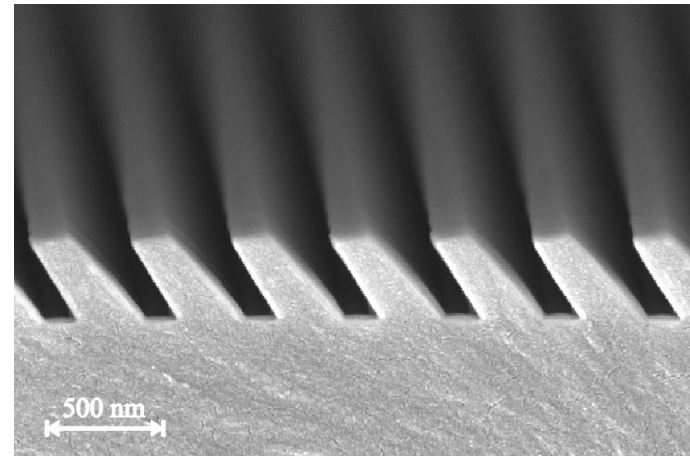
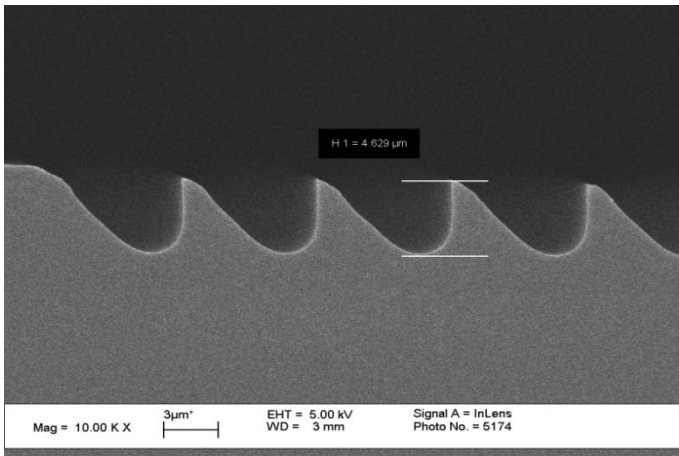
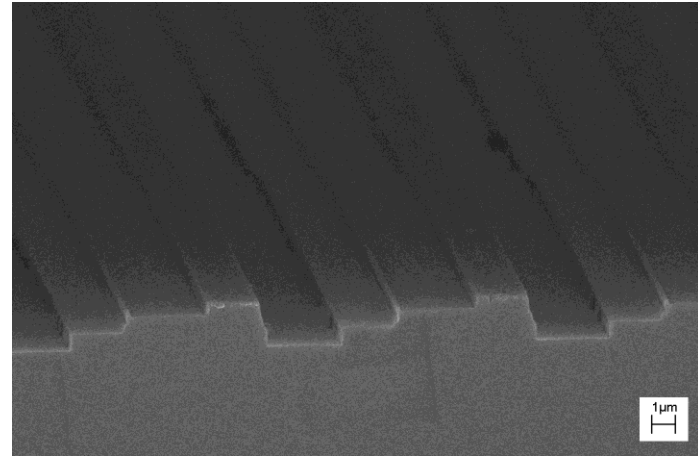
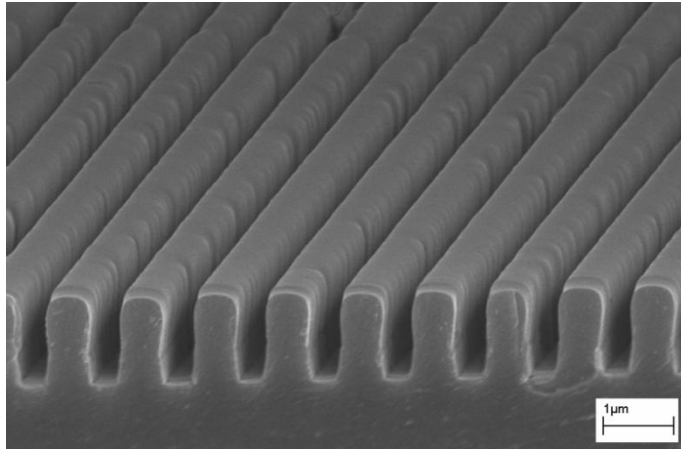
Comparison

- **Geometrical optics (ray optics)**
 - Refraction
 - Reflection
- **Diffraction optics**
 - Diffraction (light “interfere” with surface structures)



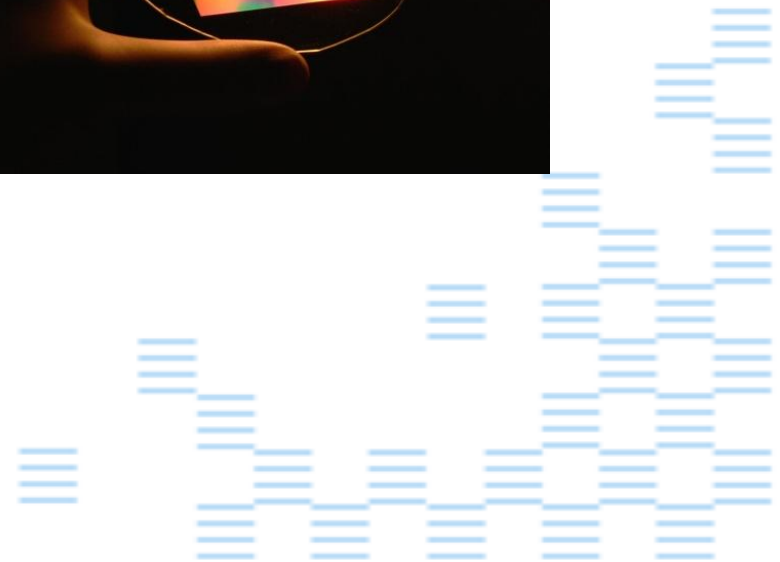
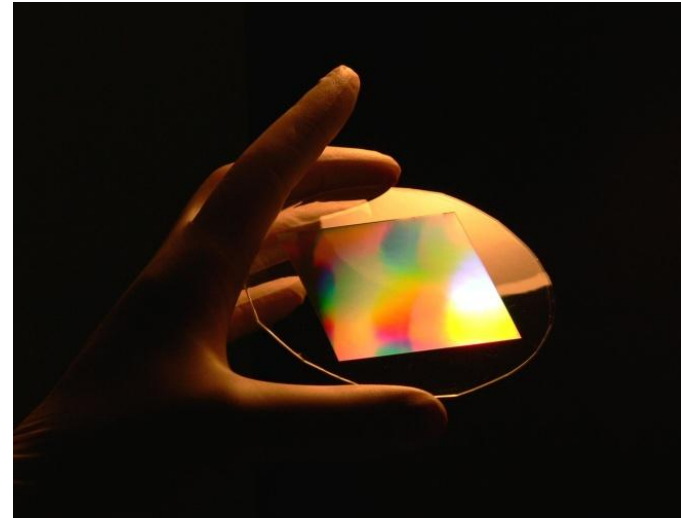
Diffraction optics





Micro and nanophotonics

allows the manipulation of light applying structures with the feature size of nano and micrometer.



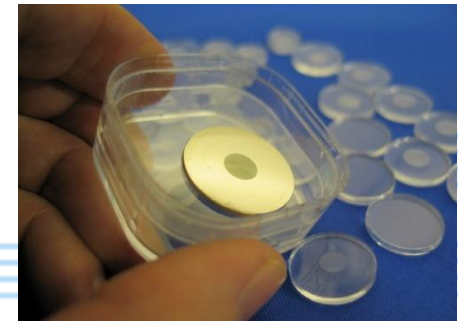
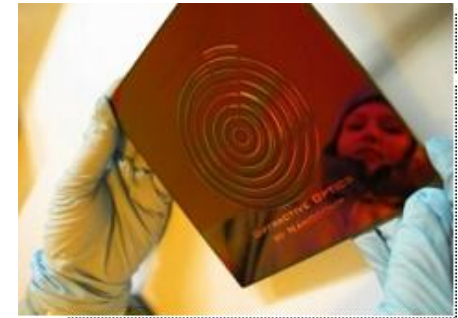
Company

Business idea: Design, manufacturing and sales of diffractive optics

Strategy: Production via R&D co-operation –establish long term co-operation, be a part of the production

Mission: to provide success stories to customers and partners

Key Figures: established 1997, private, capital share 67000€, turnover 2M€ (07)



Services

Portfolio includes custom-made B-to-B added value services for opto-electronic industry

Design

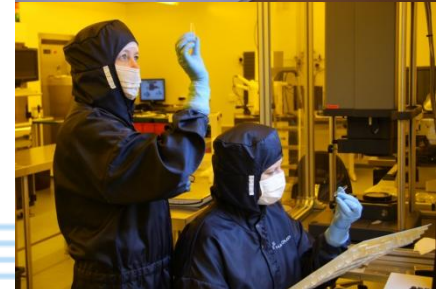
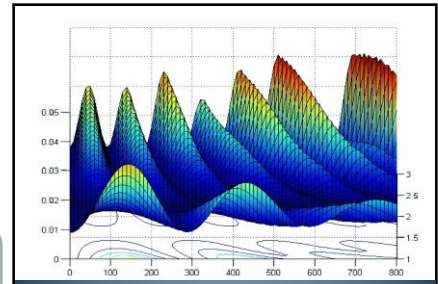
- Highly educated design team with strong experience on commercial product development of diffractive optics
- Optimised company data on Matlab and Zemax
- Productional limitations into account already in design phase

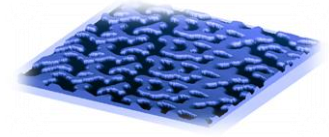
Patterning Nano- and micro structures

- Ebeam lithography
- Direct laser beam lithography
- Laser beam interferometry

Production

- Tooling; Nickel and glass tools for replication
- Replication; UV-RtoR, UV-imprint, RtoR and Hot Embossing,





Management and Personnel

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Matti Eronen

Sales Director

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Prof. Timo Jääskeläinen

Chairman of the board

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Total number of personnel **18**
(June 2007 9)

5 Ph.D and 3 M.Sc

on field of micro and
nanophotonics

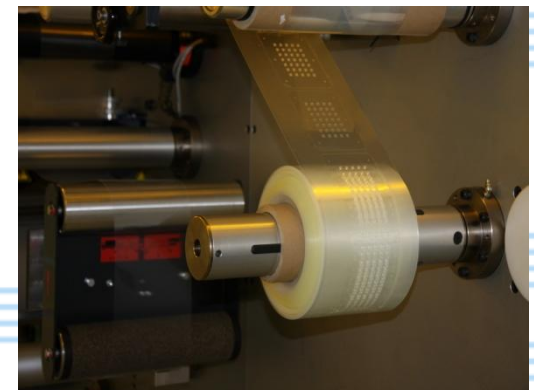
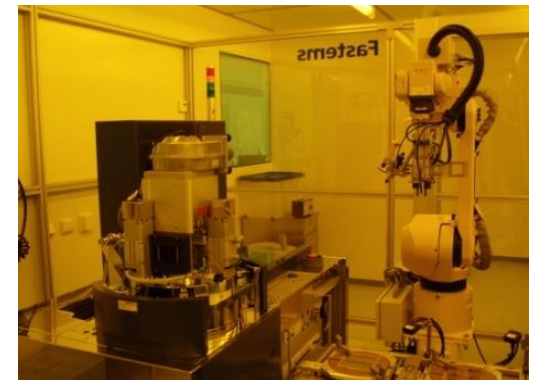
10 strong **experts** on global
plastic production,
material processing and
automation



Company location



- State of art machinery for prototyping and mass production of UV cured optical components in clean room



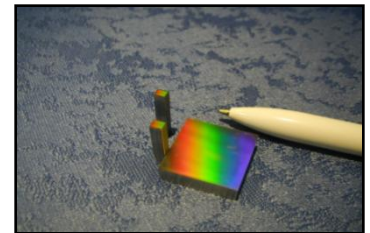
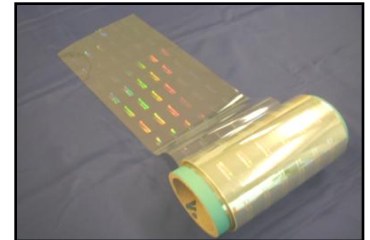
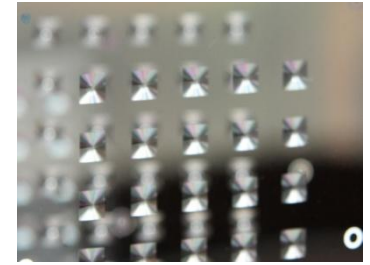
Annual capacity

- Throughput capacity
- 50 glass master plates
- 3000 nickel tools
- 50 glass mould
- 500 000 UV cured plastic components
- 1000 km embossed PC, PMMA foil
- 80Mpcs roll embossed elements (30mm x 35mm LG)
- 2000 km UV cured foil
- 300Mpcs UV cured foil elements (30mm x35mm LG)

- Machinery
- Direct laser writing
- Electron beam lithography
- Electroforming
- Reactive ion beam etching, RIBE
- Automated nanoimprint lithography
- UV roll to roll embossing
- Roll to roll embossing
- Hot embossing
- Substrate stacking
- Scanning electron microscope, SEM
- Spin coating and developing
- Profilometry
- Surface flatness inspection
- Laser cutting

Applications

- **Displays and lighting**
 - Illumination of displays, keyboards, controls
 - Lightguides, thin light guides
 - Virtual display, personal data interface
- **Beam shaping and spectral control**
 - Camera flash optics, optical filters
 - Pattern generation in laser marking and quality control
 - Microspectrometers gratings
- **Visual optical effects**
 - Security, Originality and Decorative features
 - On-cover optics



THANK YOU

VERY MUCH FOR YOUR ATTENTION

Presented by
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Nanocomp Oy Ltd,

pekka.savander@nanocomp.fi
www.nanocomp.fi

