



# EPIC Online Technology Meeting

*on white lasers and supercontinuum generation*

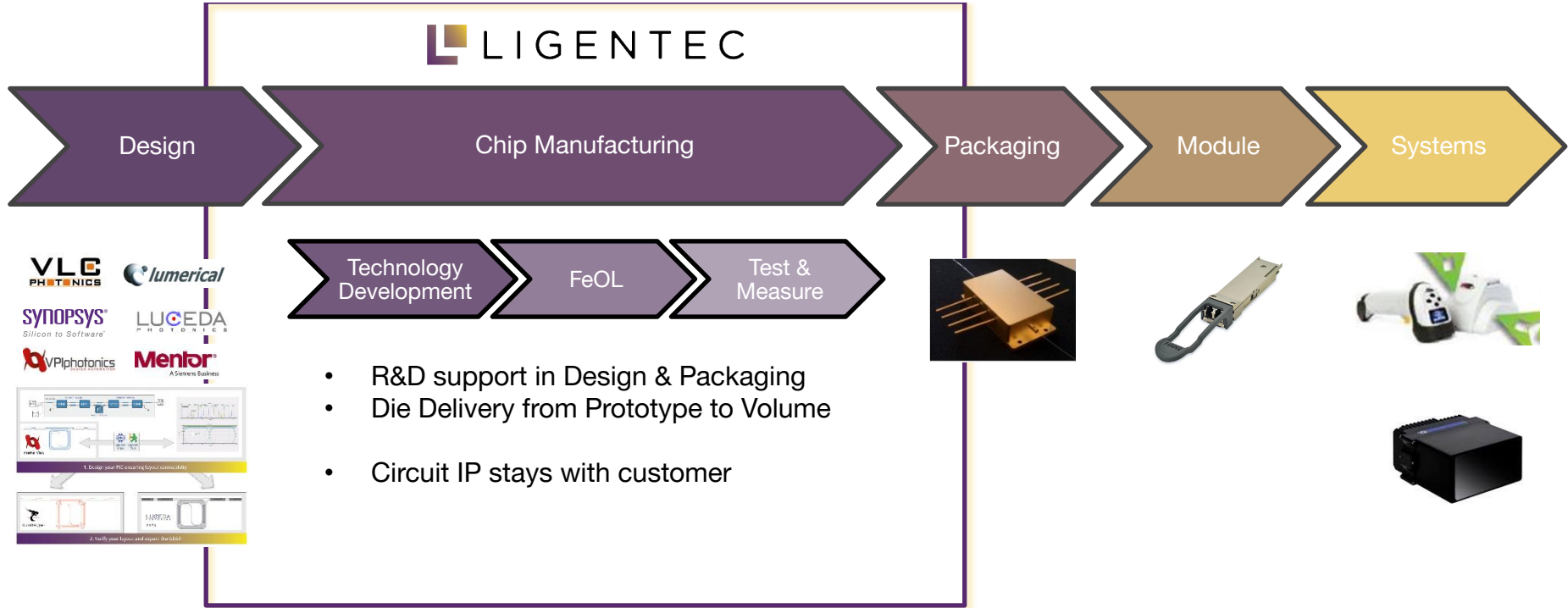
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**Anton Stroganov**

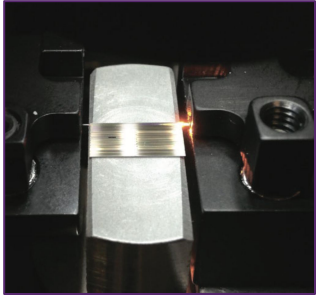
[anton.stroganov@ligentec.com](mailto:anton.stroganov@ligentec.com)  
[info@ligentec.com](mailto:info@ligentec.com)

**November 2021**

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## Should we go integrated?



High mode confinement  
High nonlinearity  
Short length  
Lithographic accuracy  
System-level integration  
Scalable fabrication

+

### *Drawbacks:*

Packaging/system assembly  
Cost for small quantities is high

VIS-MIR Range



OCT  
Spectroscopy  
Sensing  
Lasers  
Frequency Combs

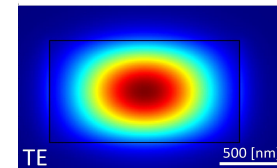
## SiN as a material:

Si Photonics

+

Wide Transparency (400-3500nm)  
High power handling (no TPA)  
Higher thermal stability  
Lower Loss

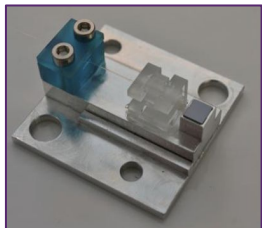
## LIGENTEC Thick SiN platform:



Low-loss  
Low phase errors  
Small footprint

**Dispersion Engineering**  
**Access to nonlinear applications**

## Packaged supercontinuum source:



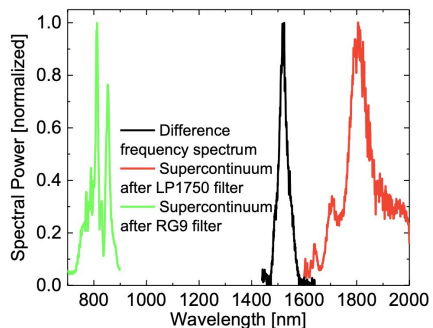
**>2000h**  
continuous SCG operation

**>3 years** shown in another project

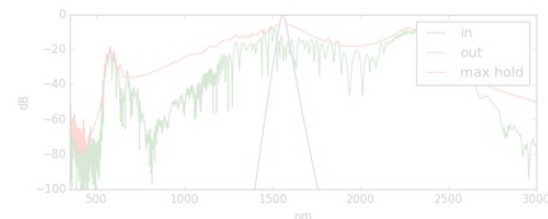
## Generation of CEO-free pulse trains:

*Er: fiber laser  
SCG on chip  
PPLN for DFG*

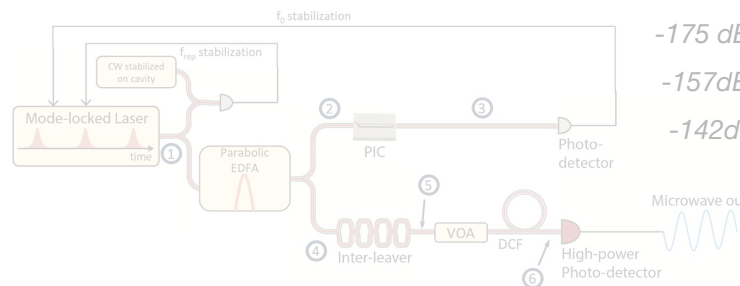
*Potential to put  
everything on chip*



## Supercontinuum + 2f/3f generation on the same chip:

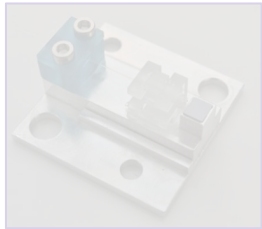


## Ultra-low-noise X-band Microwave Generator:



**-175 dBc/Hz noise floor**  
**-157dBc/Hz at 100kHz**  
**-142dBc/Hz at 10kHz**

## Packaged supercontinuum source:



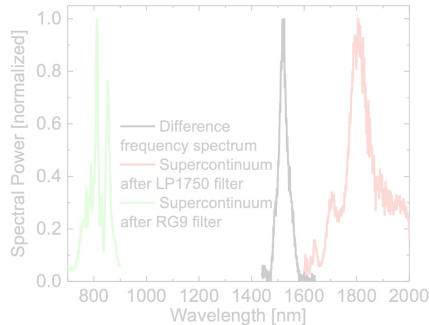
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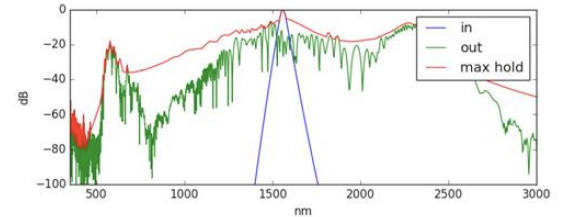
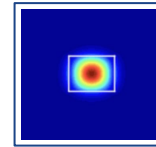
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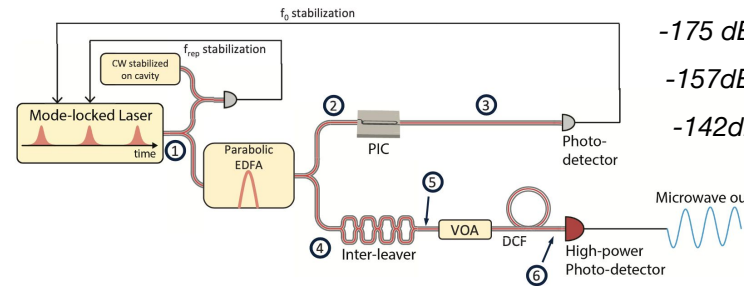
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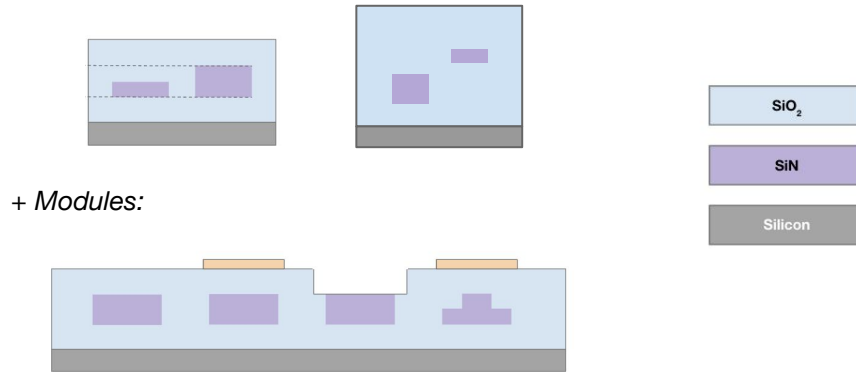


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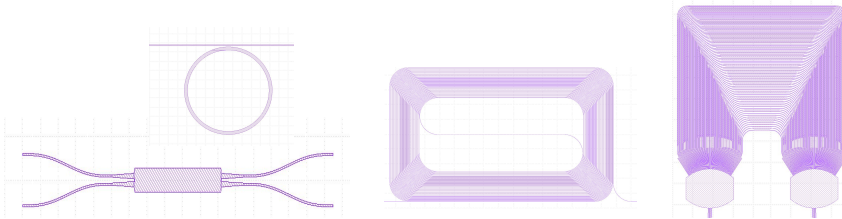


-175 dBc/Hz noise floor  
-157dBc/Hz at 100kHz  
-142dBc/Hz at 10kHz

*Scalable and versatile fabrication approach:*



*Developed PDK - components and expertise:*



*Swiss-based SiN foundry. Experts in low-loss photonics and your partner in versatile and scalable fabrication of integrated photonic circuits (PICs)*

**What we can do for you:**

*Broad transparency range (350-3500nm)*

*Low-loss (~0.1dB/cm in NIR, >2mil. Q-factors)*

*Mature, though flexible fabrication approach*

*Developed components and PDK*

*Fast turn-around (~2 months)*

**What you can do for us:**

*Packaging partners*

*Market Input (from RnD perspective)*

*Joint exploratory projects*



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