



# VALO INNOVATIONS

Ultrafast fiber lasers with pulse durations below 50 fs

**EPIC Online Technology Meeting on Femtosecond Lasers**

April 1<sup>st</sup> 2020

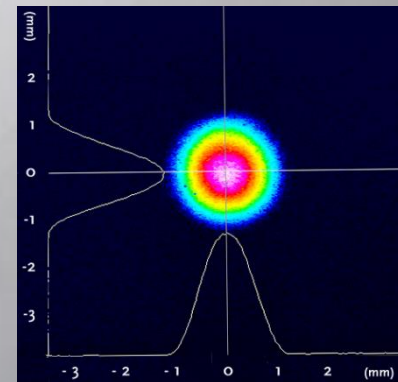
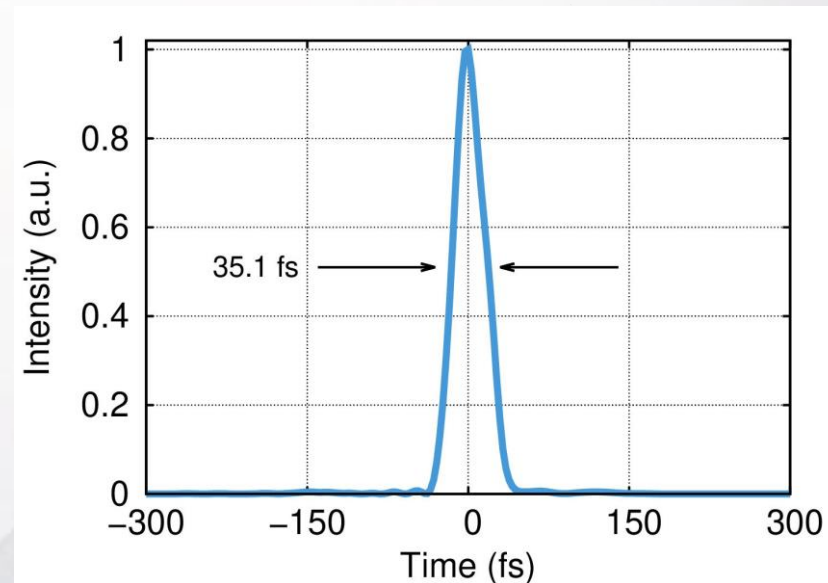
Dr. Oliver Prochnow

# VALO Innovations Products



## Products

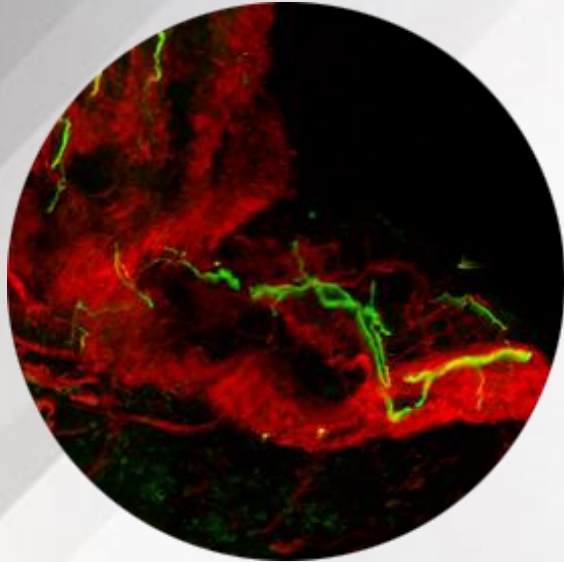
- VALO Innovations - Aalto
  - $< 40$  fs
  - $> 200$  mW
  - 30 MHz
- VALO Innovations - Tidal
  - $< 40$  fs
  - $> 3$  W
  - 30 MHz
- High Energy Laser System\*
  - $< 50$  fs
  - $> 1$   $\mu$ J
  - 30 MHz / 1 MHz
- Customer specific solutions



\* under development

# Benefits of sub 50 fs laser pulses

## Example: Multiphoton microscopy and Optogenetics



### Shorter pulses lead to

- > 5x higher efficiency (2 Photon)\*
- > 25x higher efficiency (3 Photon)\*
- > 5x reduced thermal heating\*\*
- > 2x reduced photo induced damage\*\*
- Higher contrast, resolution and scan depth



\* 40 fs vs. 200 fs  
\*\* 40 fs vs. 200 fs (same TPE)

## Life science

- Multiphoton microscopy
- Optogenetics
- Multiphoton spectroscopy
- Time resolved spectroscopy
- ...

## Sensing and security

- THz generation (seed source)
- Mid IR generation (seed source)
- Semiconductor inspection
- ...

## Material processing

- Micro- and nanomaterial processing
- Sensor manufacturing
- Two photon polymerization
- ...

## Fundamental research

- Seeding parametrical oscillators / amplifiers
- ...

**Benefit from sub 50 fs laser pulses!**

# What we can do / What you can do

## *What we can do*

- Ultrafast fiber laser
  - Sub 50 fs
  - 200 mW - 30 W
- Are you looking for „non-standard“ wavelength?
  - We can offer a solution
- You have a specific demand?
  - Ask for a customized solution
- Open for collaborations

## *What you can do*

- Do you have application ideas
- Help us to improve the lasers
  - What are you missing?
- Test our lasers for your applications
- Help us to connect with people
- Tell people that we offer sub 50 fs lasers with various power levels
- Stay safe!

The logo for VALO INNOVATIONS is centered in the upper half of the slide. The word 'VALO' is in a large, bold, sans-serif font, with the 'V' in a bright blue color and the 'ALO' in a light grey color. Below 'VALO', the word 'INNOVATIONS' is written in a smaller, all-caps, light grey sans-serif font. The background features a bright blue starburst light on the left side, with numerous thin lines radiating outwards across the dark blue background.

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Thank you very much EPIC!