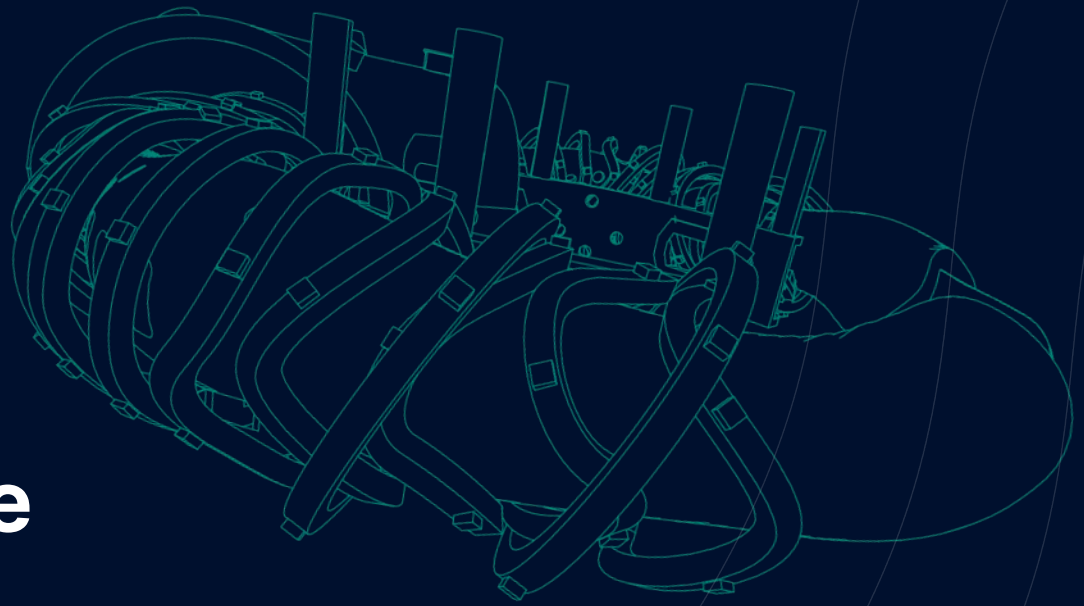
Proxima Fusion



Progress Update

Proxima Fusion's Stellarator Reactor Program

4. Forum FUSION Deutschland

Francesco Sciortino, CEO
fsciortino@proximafusion.com

What happened in 2023

Incorporation:
Proxima Fusion GmbH

January

February

Investments secured

UnternehmerTUM, Plural Platform, HTGF, Wilbe, and several angel investors

Full time operations begin
Initial team in Munich

May 15: Collaboration Agreement

July 1: Conceptual Milestone A

Version #0 of stellarator reactor conceptual design

July

September

Additional investments

Visionaries Club, Hummingbird, Flix Founders, Achleitner & Bosch family offices, tens of angel investors join Proxima.

November 1: Conceptual Milestone B

Version #1 of the stellarator reactor conceptual design

Initial HTS magnet design and prototyping plan

November

November 20: Collaboration Agreement

First optimization of support structures

December

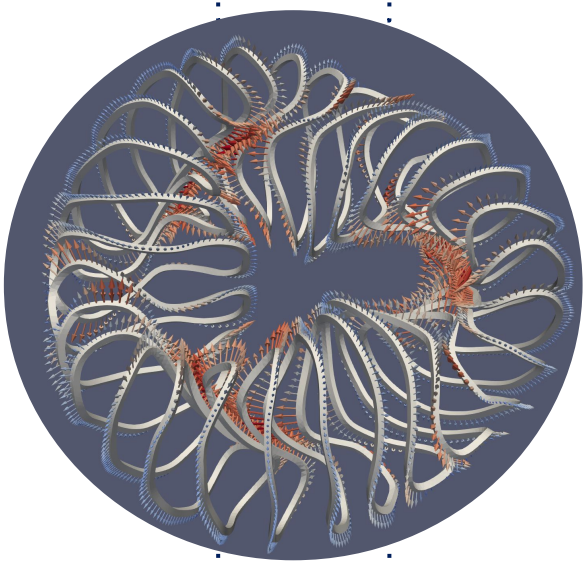
25 team members in Munich

Proxima Fusion

Advantages of QI stellarators over tokamaks

No current-driven disruptions

Today, disruptions are “fine”
Tomorrow, intolerable



No current-driven limits

No Greenwald density, only power balance limits

Continuous operation

Lower material fatigue & better energy market fit

Lower recirculating power

No central solenoid, no PF coils, less effort on control

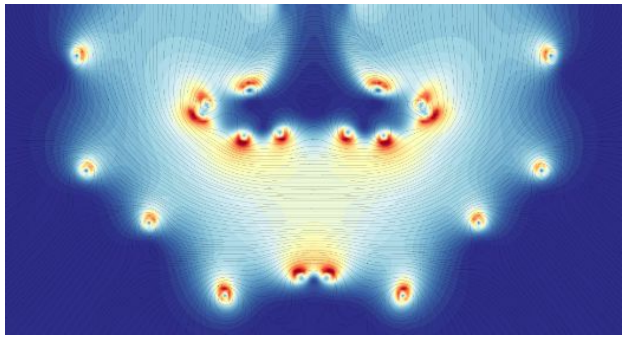
Proxima Fusion

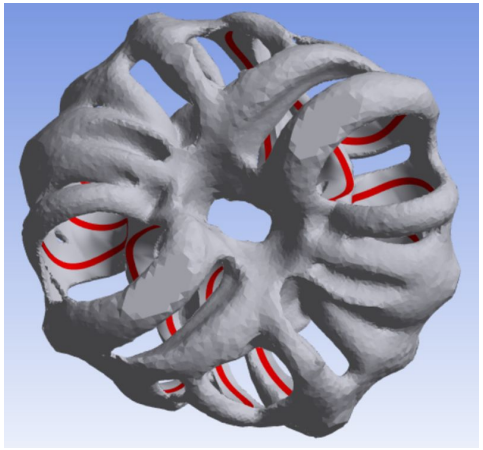
Rapid progress across “stellarator-defining” domains

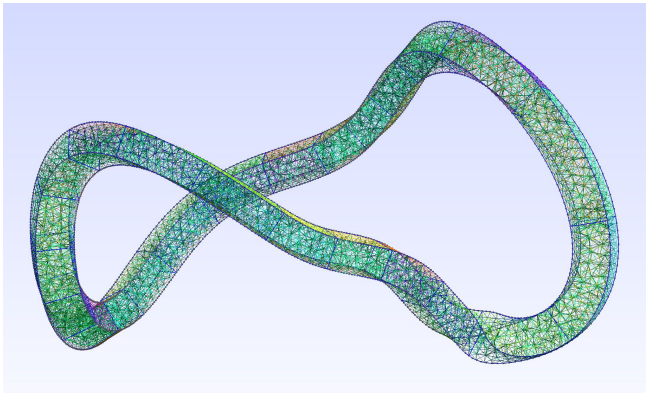
Our current focus is strongest on **technical aspects that *define* our approach to QI stellarators**

Concept Milestone B (CM-B) was completed on November 1 and focused on

- Stellarator optimization with engineering feasibility - collaboration with Max Planck IPP
- Magnets - partnership with Bilfinger-Noell
- Topological optimization of support structures - automated generative design

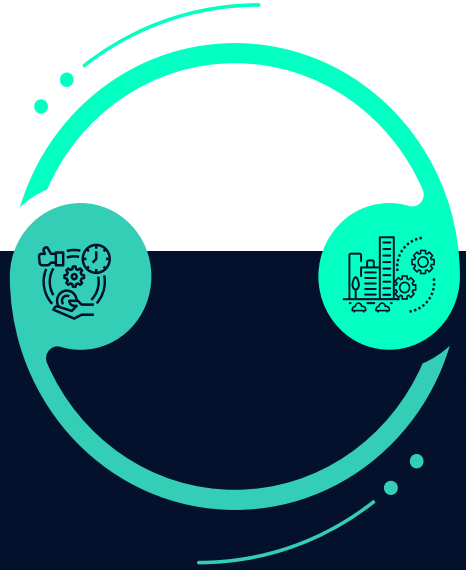






Proxima Fusion

Enabling design iterations via industry-quality software engineering



***StarFinder* enables collaboration…**

- A unified framework supporting modular, interdisciplinary contributions
- Fully integrated optimization and analysis/validation on cloud
- Physicists and engineers sharing a unified database and analysis tools

… and improves team efficiency

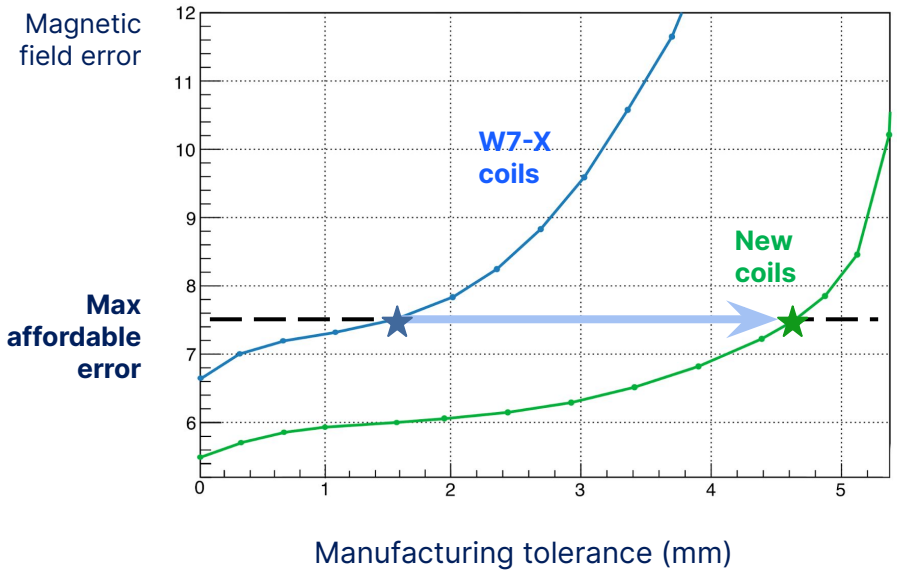
- Standardized environments.
- Elastically scalable infrastructure; resources track demand
- Minimal infrastructure management
- Instant deployment of new tests

Starfinder is Proxima's key tool to optimize **engineering feasibility** and **economic viability**

Proxima Fusion

New coil designs can reach much greater tolerances

W7-X meets its infamous 1.5 mm of manufacturing tolerances. Proxima's future devices won't need to.



3X

less strict coil tolerances

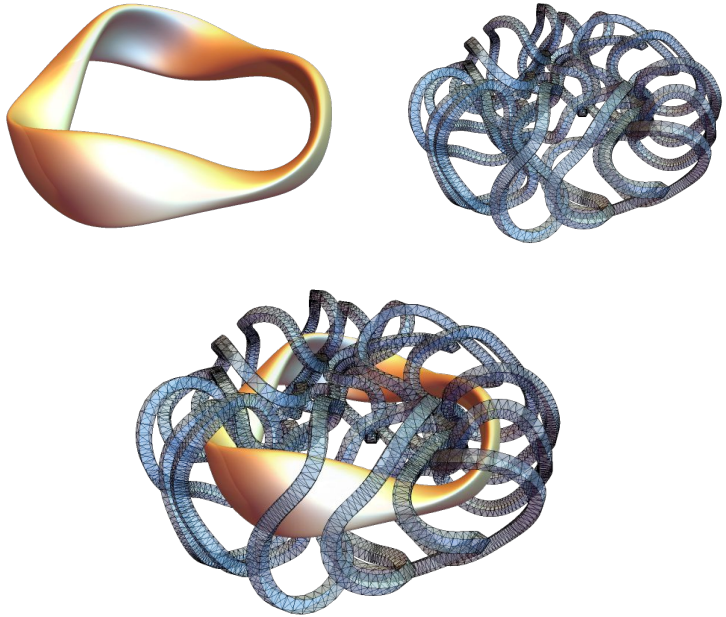
Lobsien et al., *Nuclear Fusion* 58, 10 (2018)

Proxima Fusion

Single-stage optimization

Every new stellarator configuration should be “buildable”

- (classic) **two-stage approach**:
  - optimize magnetic field (configuration)
  - optimize coils



- (new) **single-stage approach**:
  - optimize magnetic field + coils together
  - much greater number of degrees of freedom

Proxima Fusion

Industrial partnerships highlight: Bilfinger-Noell GmbH

Bilfinger-Noell co-led on **W7-X's LTS coils**

→ key expertise in superconductors and nuclear

© *Angelika Cronauer*

Now, active collaboration with Proxima on HTS tech

→ Objective: non-planar HTS coils *made in Germany*

→ *ProjectV*: first non-planar HTS coil demos
- complete by *mid-2024*

BiLFINGER NOELL GMBH / Proxima Fusion

Proxima Fusion

A new partnership for fusion: Proxima & Intel

Intel has made history as an incredible engineering company → hardware & software

Now, within the Intel Ignite program, Intel is supporting Proxima on multiple fronts:

- Business strategy
- Private fundraising
- Team organization
- Technical roadmap
- Software optimization
- Artificial Intelligence

Proxima Fusion

Proxima's partnership with Intel is already bearing results

Stay tuned for announcements!

An accelerating international fusion panorama

Several private industry players are emerging

- CFS will gain further steam with Q>2 in <3 years
- $6B invested globally, 80% in the USA

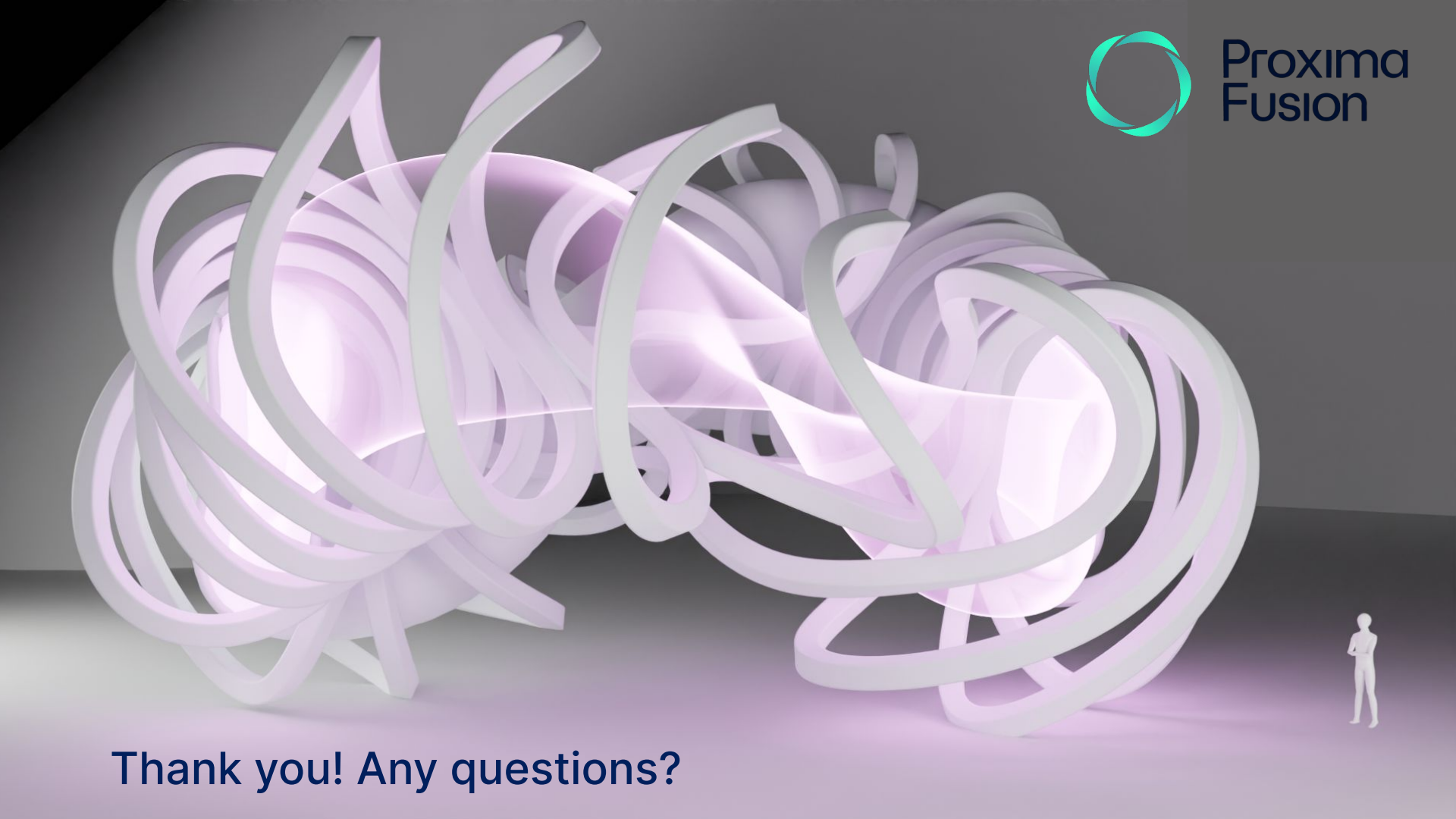
Now **more stellarator companies than tokamak ones**

- In 2022, stellarators made leaps forward
- Advantages over tokamaks have become obvious

More MFE investment in Europe than anywhere else globally

- **Germany's advantage in stellarators is undisputed** - how can we leverage it *faster*?
- VC investors look for *operational speed*, *quality of execution*, and *rapid iteration*.

Proxima Fusion



Thank you! Any questions?