



PAC

BE **PART** OF IT – THE EXPERT CIRCLE

International Conference

## Power Amplifier for Particle Accelerators

November 15<sup>th</sup> – 16<sup>th</sup> 2022  
Freiburg, Germany

*1<sup>st</sup> conference edition*

Questions?

Please contact us:

[marketing.electronics@de.trumpf.com](mailto:marketing.electronics@de.trumpf.com)

**TRUMPF**



**TRUMPF Hüttinger**  
generating confidence

## ✓ Features

- First industrial enterprise worldwide hosting a scientific conference for the particle accelerator community
- Listen to expert talks on the latest developments in the particle accelerators industry
- Stay up to date with megatrend solutions
- Network with international participants
- Enjoy an inspiring event with diversified framework program
- Finally have personal exchange with like-minded people again



## Framework program

- **Time2Network:** special slots for the expansion of your personal network
- **Company tour:** find out how TRUMPF Hüttinger generates megatrend solutions
- **Event evening:** get carried away with stress-free entertainment
- **Get-together:** look forward to the first mulled wine of the year and delicious specialties
- **Catering:** throughout the conference you will be served with regional dishes, snacks and drinks



## Location

Let yourself be enchanted by this year's location in Freiburg im Breisgau – the most multifaceted city in southern Germany. See more on page 11.



Dear valued partner,

We are delighted to welcome you to our first PA<sup>2</sup> conference where we bring together the scientific community in an industrial environment. For the first edition of PA<sup>2</sup> we would like to encourage participants convince themselves of the outstanding conference quality. Therefore, we are not charging a conference fee in the launch year. This allows you to participate free of charge in the entire conference program with top-class expert talks and an enjoyable framework program.

**“BE PART OF IT – THE EXPERT CIRCLE”**

The presentations held at the **Power Amplifier for Particle Accelerator** conference will cover the status of accelerator projects at the main accelerator facilities world-wide, the upgrade status to the latest technology and the advantages of the transistor based modular amplifier concept. Additionally, we have invited speakers to demonstrate the use of accelerators for medical purposes and in a special application session show how laser-generated nanoparticles can help to utilize synchrotron radiation and even potentially improve the tumor treatment through protons. We look forward to seeing you in Freiburg!

Your TRUMPF Hüttinger Team



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### Session 1

## Synchrotron and Hadron Facilities

Particle Accelerator facilities exist around the globe. The light sources and the enormous impact of fast hadrons attract some of the most brilliant researchers around the world to perform a variety of highly attractive experiments. But behind the scenes a very skilled interdisciplinary team keeps the particles running and paves the way to new velocities.

### Session 2

## Industry Technology for Particle Accelerators

Whether it be RF amplifier technology, particle sources, vacuum technology, LLRF signals – building an accelerator does not only require an enormous effort of experts in different fields working together. It also needs industrial partners capable of such products meeting the demands for probably the world's most complicated machines. With the understanding that this is a very interdisciplinary task the PA<sup>2</sup> – international conference on Power Amplifier for Particle Accelerators – will be a platform where industry partners present their achievements for particle accelerators.

### Session 3

## Application of Accelerated Particles

From fundamental research and application of synchrotron radiation to the improvement of tumor treatment via laser-generated nanoparticles – we will cover a broad range of sophisticated utilization from accelerated particles. Beyond the fascinating capability to extract highly brilliant photons from electrons a view to ongoing activities for future accelerator driven systems will be given in this session. Already in operation and rapidly growing: the use of accelerators for tumor treatment is an emerging field. Since the launch of the first facility operating with heavy ions in Europe in 2009 great success in continuously improving this technology was made.

## Overview sessions



Day 1, November 15<sup>th</sup>  
 Synchrotron and hadron facilities  
 & Industry technology

08 <sup>30</sup> - 09 <sup>45</sup>	Conference registration Welcome & Keynote
09 <sup>45</sup> - 10 <sup>15</sup>	Synchrotron and hadron facilities
10 <sup>15</sup> - 11 <sup>00</sup>	Time2Network
11 <sup>00</sup> - 12 <sup>20</sup>	Synchrotron and hadron facilities
12 <sup>20</sup> - 14 <sup>00</sup>	Lunch break
14 <sup>00</sup> - 15 <sup>10</sup>	Synchrotron and hadron facilities
15 <sup>10</sup> - 15 <sup>50</sup>	Time2Network
15 <sup>50</sup> - 16 <sup>50</sup>	Industry technology
from 17 <sup>00</sup>	Event evening

Day 2, November 16<sup>th</sup>  
 Industry technology, application notes  
 & Synchrotron and hadron facilities

08 <sup>15</sup> - 11 <sup>00</sup>	Company tour
11 <sup>00</sup> - 11 <sup>30</sup>	Time2Network
11 <sup>30</sup> - 12 <sup>30</sup>	Industry technology
12 <sup>30</sup> - 14 <sup>00</sup>	Lunch break
14 <sup>00</sup> - 15 <sup>10</sup>	Application notes
15 <sup>10</sup> - 15 <sup>40</sup>	Time2Network
15 <sup>40</sup> - 16 <sup>20</sup>	Synchrotron and hadron facilities
16 <sup>20</sup> - 16 <sup>50</sup>	Q&A
16 <sup>50</sup> - 17 <sup>00</sup>	Conclusion of conference



November 14<sup>th</sup>

from 18<sup>00</sup> Casual get-together




For further information please visit  
[www.trumpf.info/PA2](http://www.trumpf.info/PA2)

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	<b>Conference registration</b>	<b>08<sup>30</sup> - 08<sup>45</sup></b>	
	Welcome – Start of the conference	08 <sup>45</sup> - 09 <sup>15</sup>	
1	Keynote: High power solid state power amplifier systems at CERN for particle acceleration	09 <sup>15</sup> - 09 <sup>45</sup> *	Eric Montesinos, CERN, CH
	<b>Session: Synchrotron and hadron facilities</b>		
2	Upgrade of the PETRA synchrotron – focus on high-frequency station requirements	09 <sup>45</sup> - 10 <sup>15</sup> *	Rüdiger Onken, DESY, DE
	 <b>Time2Network / Meet the engineers!</b>	<b>10<sup>15</sup> - 11<sup>00</sup></b>	
3	Overview of the SPS-II project and its RF systems	11 <sup>00</sup> - 11 <sup>30</sup> *	Dr. Nawin Juntong, SLRI, TH
4	Accelerator driven systems	11 <sup>30</sup> - 11 <sup>50</sup> *	Prof. Holger Podlech, Institute of Applied Physics (IAP), Goethe University Frankfurt am Main, DE
5	High reliability solid state amplifiers for CiADS	11 <sup>50</sup> - 12 <sup>20</sup> *	Yuan He, Institute of Modern Physics, CAS, CN
	 <b>Lunch break</b>	<b>12<sup>20</sup> - 14<sup>00</sup></b>	

\* incl. 5 mins discussion

<p><b>Session: Synchrotron and hadron facilities</b></p>			
6	ELBE high power RF system	14 <sup>00</sup> - 14 <sup>20</sup> *	Dr. Michael Kuntzsch, HZDR, DE
7	Solid state VS tube power amplifiers, in the frame of the wide band cyclic accelerators, advantages and disadvantages	14 <sup>20</sup> - 14 <sup>40</sup> *	Antonio Caruso, Laboratori Nazionali del Sud – Istituto Nazionale di Fisica Nucleare, IT
8	High power RF systems for the injector linacs of the facility for antiproton and ion research FAIR	14 <sup>40</sup> - 15 <sup>10</sup> *	Dr. Bernhard Schlitt, GSI – Gesellschaft für Schwerionenforschung, DE
<p> <b>Time2Network / Meet the engineers!</b></p>		<b>15<sup>10</sup> - 15<sup>50</sup></b>	
<p><b>Session: Industry technology</b></p>			
9	RF system for MINERVA	15 <sup>50</sup> - 16 <sup>10</sup> *	Victor Martínez Illamola, SCK-CEN / ADB – Accelerator Design and Build, BE
10	Turbopumps: Lowest vibration and highest uptime made with laser balancing technology	16 <sup>10</sup> - 16 <sup>30</sup> *	Andreas Schopphoff, Pfeiffer Vacuum, DE
11	Overall efficiency of solid state power amplifier – Combining power level	16 <sup>30</sup> - 16 <sup>50</sup> *	Dr. Marcus Lau, TRUMPF Hüttinger, DE
Conclusion day 1		16 <sup>50</sup> - 17 <sup>00</sup>	
<b>Evening event</b>		<b>17<sup>00</sup> - 21<sup>00</sup></b>	

\* incl. 5 mins discussion



	<b>Company tour: Efficiency@TRUMPF Hüttinger</b>	<b>08<sup>15</sup> - 11<sup>00</sup> (incl. travel)</b>	Meeting point: Entrance of conference venue
	<b>Time2Network / Meet the engineers!</b>	<b>11<sup>00</sup> - 11<sup>30</sup></b>	
	<b>Session: Industry technology</b>		
12	Digital LLRF system	11 <sup>30</sup> - 11 <sup>50</sup> *	Borut Baricevic, i-TEC, SI
13	Secondary sources initiative at TRUMPF	11 <sup>50</sup> - 12 <sup>10</sup> *	Dr. Torsten Mans, TRUMPF Laser, DE
14	Redundant SSPA design for dynamic VSWR	12 <sup>10</sup> - 12 <sup>30</sup> *	Felix Baum, TRUMPF Hüttinger, DE
	<b>Lunch break</b>	<b>12<sup>30</sup> - 14<sup>00</sup></b>	
	<b>Session: Application notes</b>		
15	Improved proton therapy by laser-generated nanoparticles	14 <sup>00</sup> - 14 <sup>30</sup> *	Prof. Stephan Barcikowski, University Duisburg-Essen, CENIDE, DE
16	Ion linear accelerators in research and medicine	14 <sup>30</sup> - 14 <sup>50</sup> *	Dr. Ulrich Ratzinger, Institute of Applied Physics (IAP), Goethe University Frankfurt am Main, DE
17	Detectors for the use in medical accelerators	14 <sup>50</sup> - 15 <sup>10</sup> *	Dr. Jens Weingarten, TU Dortmund – AG Kröninger, DE
	<b>Time2Network / Meet the engineers!</b>	<b>15<sup>10</sup> - 15<sup>40</sup></b>	

\* incl. 5 mins discussion

<b>Session: Synchrotron and hadron facilities</b>			
18	RF components and systems at KIT electron accelerators	15 <sup>40</sup> - 16 <sup>00</sup> *	Dr. Anton Malygin, Institute for Beam Physics and Technology (IBPT), KIT, DE
19	Accelerators for H-, Electron, and Rare Isotope Beams at TRIUMF	16 <sup>00</sup> - 16 <sup>20</sup> *	
	Q&A: Future development of solid state amplifier – expert response from R&D TRUMPF Hüttinger	16 <sup>20</sup> - 16 <sup>50</sup> *	
	Conclusion of conference	16 <sup>50</sup> - 17 <sup>00</sup>	
<b>Free time to explore Freiburg</b>			



Please visit our website for latest news:  
[www.trumpf.info/PA2](http://www.trumpf.info/PA2)

\* incl. 5 mins discussion

# Freiburg



**What can you do around the conference?** Let yourself be enchanted by this year's location in sunny Freiburg im Breisgau. Discover the area and experience the mix of historical sights and modern life. Beautifully situated in the border triangle in direct proximity to the French and Swiss borders and the entrance to the Black Forest in eastern direction – Freiburg is scenic alone an experience with a lot of nature, a lot of space and good wine from the famous adjacent "Kaiserstuhl". Allegedly, every second German would prefer to live in Freiburg. In fact, there are so many reasons to fall madly in love with this city that one can hardly list them all.





## Conference venue and accommodation

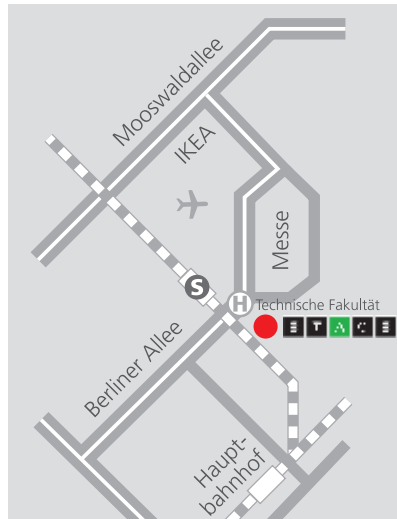
### ETAGE Conference Center at Freiburg Exhibition Center

Emmy-Noether-Straße 2  
79110 Freiburg

GPS coordinates: 8° 00' 44.6" | 7° 50' 10.2"

The conference venue has excellent public transport connections. The stop at conference venue is called ‚Technische Fakultät‘.

Find here the optimal connection:



### Accommodation

Visit the conference website to find a hotel with good public transportation access to the conference center.

We have reserved contingents there you can book on yourself.

Conference website:



**TRUMPF Hüttinger** is a high-tech company and a leading global manufacturer of DC, medium-frequency, high-frequency and semiconductor-based solid-state microwave generators. One important application for microwave generators is transistor-based solid-state power amplifiers which are increasingly replacing electron tubes in particle accelerators for research, medical and industrial applications.



## Innovative solutions for microwave applications

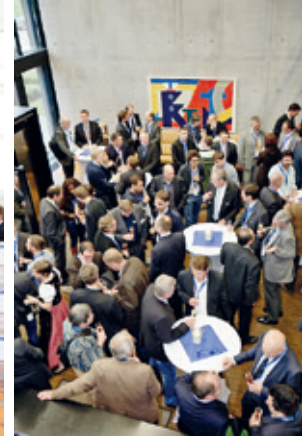
TRUMPF Hüttinger took over the microwave technology company HBH Microwave in January 2020. Due to this acquisition TRUMPF Hüttinger extended its technology portfolio to include semiconductor-based solid-state microwave generators. Particle accelerators for research, medicine and industry is another important market the company is keeping its eye on. We look back on 100 years of experience and constant further development - always on the cutting edge of time. We are shaping the future - with you as our partner.





# Have a look at previous conferences

hosted by  
TRUMPF Hüttinger







Impressions



## Registration

Conference  
website



Company  
website



**TRUMPF Hüttinger GmbH + Co. KG**  
Bötzingen Straße 80 | 79111 Freiburg | Germany  
marketing.electronics@de.trumpf.com



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