



PRESS RELEASE

MORE ACCURATE TUMOUR TREATMENT THANKS TO SUPERCONDUCTIVE ASG SUPERCONDUCTORS TECHNOLOGY

THE WORLD'S FIRST SCIENTIFIC PROTOTYPE COMBINING REAL TIME MAGNETIC RESONANCE IMAGING WITH PROTON THERAPY FOR TUMOURS ON THE MOVE WITH 'MADE IN ITALY' SUPERCONDUCTING MgB₂ TECHNOLOGY IS INAUGURATED IN GERMANY (DRESDEN)

MONITORING CANCER PATIENTS USING REAL-TIME MAGNETIC RESONANCE IMAGES AND SIGNIFICANTLY IMPROVING THE ACCURACY OF PROTON THERAPY: THIS IS THE GOAL THAT DOCTORS FROM SAXONY HAVE SET THEMSELVES TOGETHER WITH SCIENTISTS FROM THE HELMHOLTZ CENTRE IN DRESDEN-ROSSENDORF AND DRESDEN UNIVERSITY MEDICINE IN COLLABORATION WITH ASG.

Genoa - ITALY, Dresden - GERMANY 10 January 2024. ASG Superconductors' (ASG) MgB₂ superconducting technology - already in use for energy and medical applications such as the world's only truly open MROpenEVO magnetic resonance imaging (MRI) system - is at the heart of the worldwide innovation presented today in Dresden in the field of proton therapy and cancer treatment using real-time MRI imaging.

In fact, MRI offers the advantage over conventional imaging modalities of being able to visualise tumours with unsurpassed soft tissue image contrast. This makes it possible to better delineate the tumour from the surrounding healthy tissue and to more precisely define the volume to be irradiated. In addition, MRI guidance is able to map changes in the shape and size of the volume to be irradiated that occurs between successive treatment sessions, allowing the application of radiation to be adjusted individually and immediately. One of the key points of this scientific and technological breakthrough, which will have an impact on cancer treatment, is precisely the real-time MRI, which makes it possible to visualise the movement of the tumour during an irradiation session and to synchronise it with the application of radiation.

With the prototype presented today in Germany at OncoRay - the National Centre for Radiation Research in Oncology, it will in fact be possible, for the first time in the world, to study the extent to which the accuracy of proton therapy can be improved with the guidance of real-time MRI for the whole body. Head of the research group 'Experimental MR-integrated Proton Therapy' Prof. Aswin Hoffmann, with whom ASG engineers have been collaborating on the development of the new system over the years, said: *"With this new prototype of integrated whole-body MRI, it is possible to visualise moving tumours with high-contrast images in real time. The goal of our work is to develop a technique to irradiate moving tumours only when they are in the right position to be hit by the proton beam. The MRI device, which can be rotated around the*



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patient, offers the possibility of using innovative types of positioning of the patient to be treated with proton therapy in both recumbent and upright positions”.

The prototype, based on the ASG technology already used for the MROpenEVO system, the only MRI in the world with a completely open design and MgB₂ cryogen-free superconductive technology, will be used to demonstrate through scientific studies the added value of this new treatment modality for tumours in the chest, abdomen and pelvis. The development and installation as well as commissioning were made possible thanks to the close collaboration with international technological and industrial partners such as ASG Superconductors, which, besides being the manufacturer of the MRI device used as a base, holds historical expertise in the development, design and manufacture of superconducting MRI magnets from 0.5T up to Ultra High Field 11.7T, while the company MagnetX Oncology Solutions, Edmonton/Canada, designed the rotating technology part.

Marco Nassi, CEO – ASG Superconductors declared *“It is very challenging to contribute to such an innovative technical and scientific project in the proton therapy sector in close collaboration with highly prestigious hospitals, partners, and universities. We are, even more so, very proud that our technologies and skills in terms of MgB₂ superconducting material, magnets and MRI systems can provide a substantial contribution in making tumour treatments more effective in the near future”.*

For more information on ASG Superconductors

www.asgsuperconductors.com

For more information on the MgB₂ open MRI technology

www.mropenevo.com

For more information on the scientific project

<https://www.oncoray.de/>

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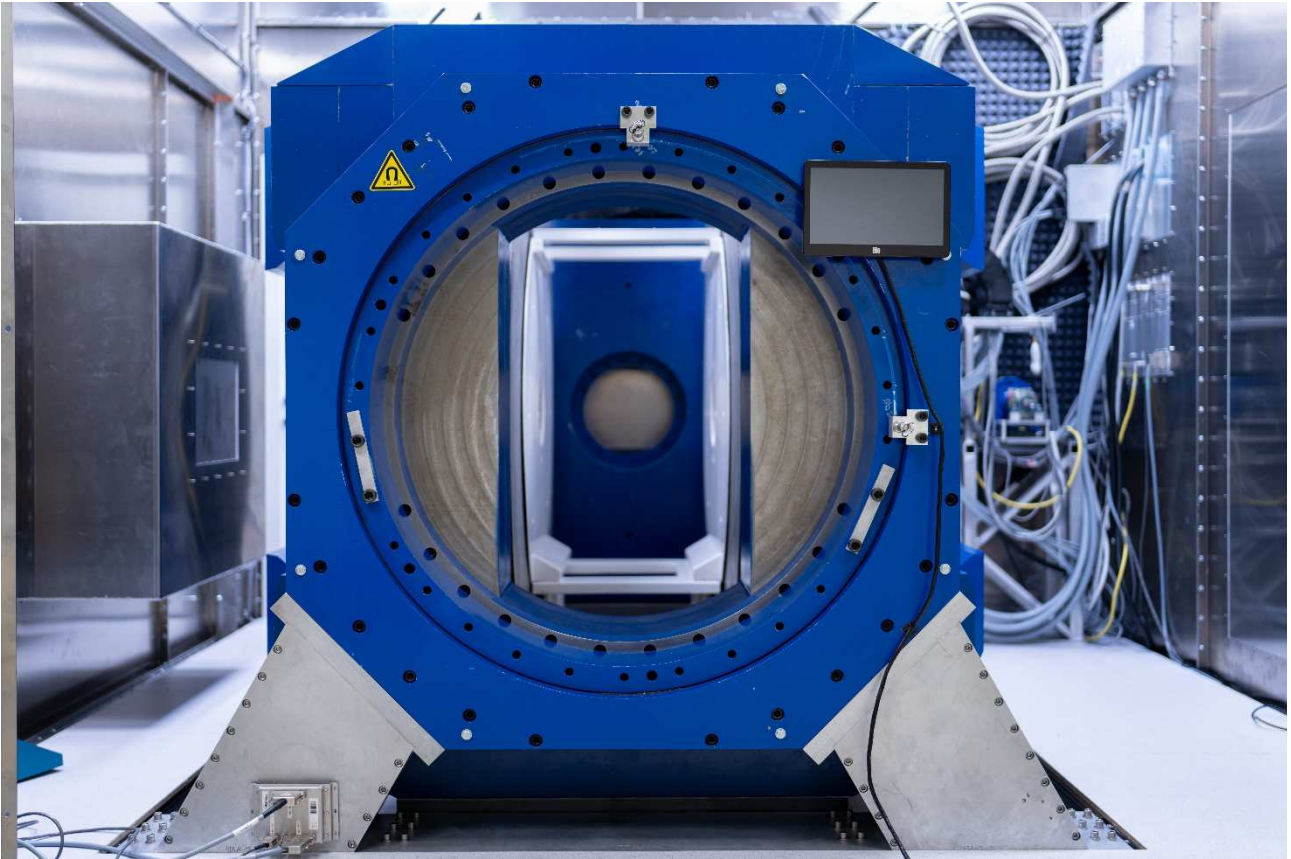
Picture with courtesy of "UKD / Kirsten Lassig"

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Picture with courtesy of "UKD / Kirsten Lassig"

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Picture with courtesy of "UKD / Kirsten Lassig"



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WITH UNIQUE MGB2 SUPERCONDUCTING HELIUM-FREE TECHNOLOGY

90°

ASG SUPERCONDUCTORS

HEALTHCARE

evo MROpen

MagnetTx

HZDR HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF


The image shows a large, blue, cylindrical MRI magnet assembly. The central part of the magnet is a white, ring-shaped structure. The text '90°' is prominently displayed in the center of the magnet. The background is a dark blue gradient. Various logos and text are overlaid on the image, including the ASG Superconductors logo in the top left, the OncoRay ZIK logo in the top right, the 'HEALTHCARE' text and a fingerprint icon in the upper right, the 'evo MROpen' logo in the bottom left, the 'MagnetTx' logo in the bottom center, and the 'HZDR HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF' logo in the bottom right.




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360° ROTATING
WITH LIVE MR
IMAGING DURING
PROTON DOSE
DELIVERY

ASG
SUPERCONDUCTORS

HEALTHCARE 

evo MROpen

Magnetix  **HZDR**
HELMHOLTZ ZENTRUM
DRESDEN ROSSENDORF

The central image is a 3D rendering of a proton therapy gantry with an open MR scanner integrated into it. A patient is lying on the treatment table inside the gantry. The scene is set against a dark blue background with a grid pattern. The text '360° ROTATING WITH LIVE MR IMAGING DURING PROTON DOSE DELIVERY' is prominently displayed on the left side of the image. Logos for ASG Superconductors, Healthcare (with a heart fingerprint icon), Magnetix, and HZDR (Helmholtz Zentrum Dresden Rossendorf) are also present.

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CANCER
is the 2nd
cause of death
in western
world

**PROTON
THERAPY**
is one of the
pillars of
modern cancer
therapy

The infographic features a blue line-art silhouette of a human head and torso. A speech bubble from the chest area contains the text 'CANCER is the 2nd cause of death in western world' and a small blue sphere with a white dot. Below this, there are blue wavy arrows pointing upwards and several blue circles of varying sizes, some containing a white plus sign. A circular inset on the right shows a grayscale medical scan of a human head with a blue 3D model of a proton beam's path overlaid on the brain. A blue line connects the bottom of the silhouette to the bottom of the circular inset.

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Experts from multiple fields developed a new form of radiotherapy for the treatment of cancer.



RADIATION
MEDICINE



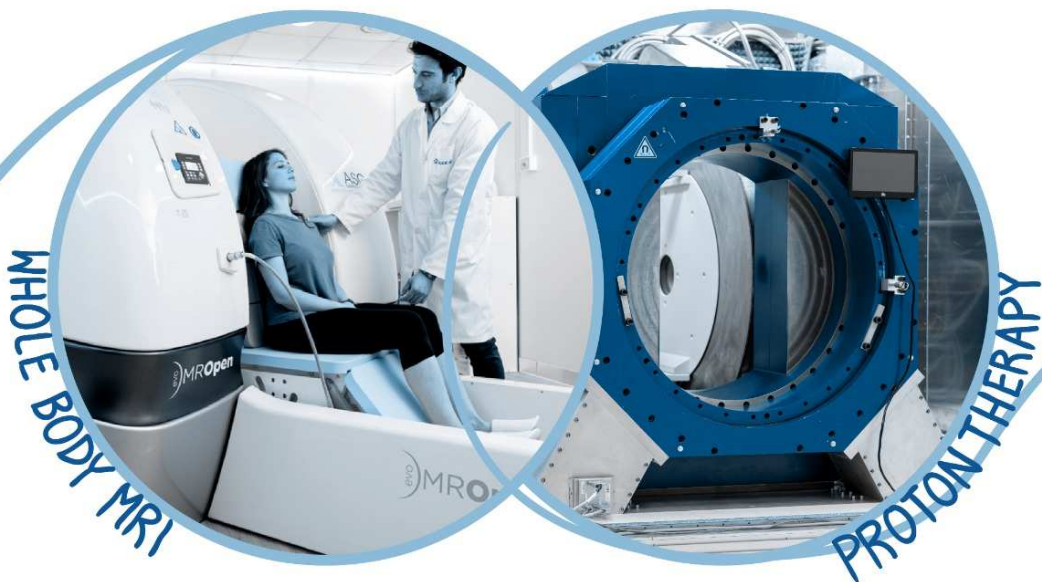
MEDICAL
PHYSICS



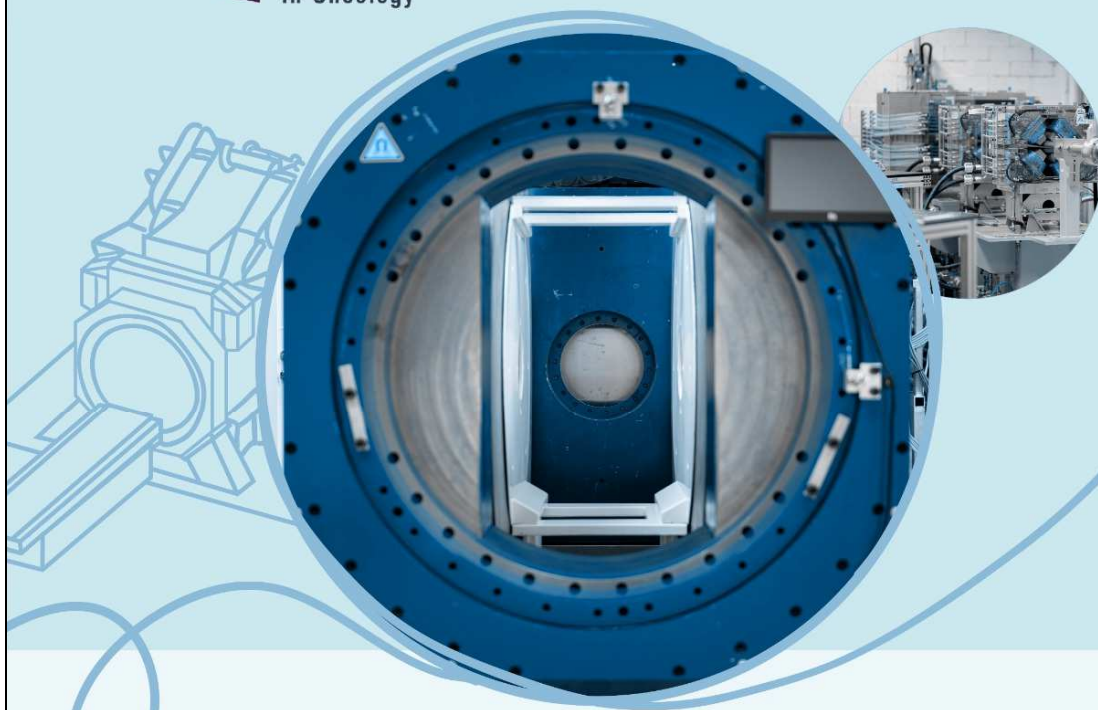
BIOLOGY



ENGINEERING



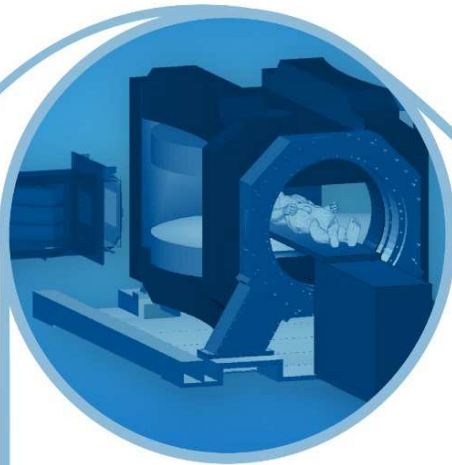
COMBINED WITH



A globally unique combination of a whole-body MRI device for real-time imaging that can rotate around the patient and a horizontal proton therapy delivery system has been created.

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MRI imaging better discriminate the tumor from surrounding healthy tissue and more accurately define the volume to be irradiated.

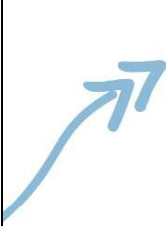


MRI imaging can map any changes in the shape and size of the volume to be irradiated between successive irradiation sessions, making it possible to adjust the radiation application individually and immediately.



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The development and installation of the prototype was made possible in close cooperation with international industrial partners



OPEN MRI SYSTEM
BASED ON MgB_2
TECHNOLOGY



ROTATING
GANTRY



PRESS RELEASE

CURA DEI TUMORI PIÙ ACCURATA GRAZIE ALLA TECNOLOGIA SUPERCONDUTTIVA

INAUGURATO IN GERMANIA, A DRESDA, IL PRIMO PROTOTIPO SCIENTIFICO AL MONDO CHE UNISCE RISONANZA MAGNETICA E PROTONTERAPIA PER TUMORI IN MOVIMENTO CON LA TECNOLOGIA SUPERCONDUTTIVA MgB2 "MADE IN ITALY" DI ASG SUPERCONDUCTORS.

MONITORARE I PAZIENTI ONCOLOGICI UTILIZZANDO IMMAGINI DI RISONANZA MAGNETICA IN TEMPO REALE E MIGLIORARE IN MODO SIGNIFICATIVO L'ACCURATEZZA DELLA PROTONTERAPIA: QUESTO È L'OBIETTIVO CHE I MEDICI SASSONI SI SONO POSTI INSIEME AGLI SCIENZIATI DEL CENTRO HELMHOLTZ DI DRESDA-ROSSENDORF E DELLA MEDICINA UNIVERSITARIA DI DRESDA COLLABORANDO CON ASG.

Genova – ITALIA, Dresda - GERMANIA 9 gennaio 2024. La tecnologia superconduttiva MgB2 di ASG Superconductors (ASG) - già utilizzata per applicazioni energetiche e medicali quali ad esempio l'unico sistema di risonanza magnetica (MRI) realmente aperto al mondo MROpenEVO - è il cuore dell'innovazione mondiale presentata oggi a Dresda nel settore della protonterapia e della cura dei tumori tramite imaging MRI in tempo reale.

La risonanza magnetica infatti offre il vantaggio, rispetto alle modalità di imaging convenzionali, di poter visualizzare i tumori con un contrasto d'immagine ineguagliabile con altre tecnologie. Ciò consente di delineare meglio il tumore dal tessuto sano circostante e di definire con maggiore precisione il volume da irradiare. Inoltre, la risonanza magnetica è in grado di mappare cambiamenti nella forma e nelle dimensioni del volume da irradiare che sono intervenuti tra sessioni successive, consentendo così di regolare l'applicazione delle radiazioni in modo individuale e immediato. Uno dei punti chiave di questa innovazione scientifica e tecnologica, che avrà impatto sulle terapie dei tumori, è proprio la risonanza magnetica in tempo reale che permette di visualizzare il movimento del tumore durante una sessione di irradiazione e di sincronizzarlo con l'applicazione delle radiazioni.

Con il prototipo presentato oggi in Germania presso OncoRay – Centro Nazionale di Ricerca sulle Radiazioni in Oncologia, sarà infatti possibile, per la prima volta al mondo, studiare in che misura l'accuratezza della terapia protonica possa essere migliorata con la guida della risonanza magnetica in tempo reale per tutto il corpo. Il capo del gruppo di ricerca "Experimental MR-integrated Proton Therapy" Prof. Aswin Hoffmann, con cui i tecnici di ASG hanno collaborato in questi anni allo sviluppo del nuovo sistema, ha dichiarato: *"Con questo nuovo prototipo di risonanza magnetica integrata per tutto il corpo, è possibile visualizzare i tumori in movimento con immagini ad alto contrasto in tempo reale. L'obiettivo del nostro lavoro è sviluppare una tecnica per irradiare i tumori in movimento solo quando possono essere colpiti in modo affidabile dal fascio di protoni. Il dispositivo di risonanza magnetica, che può essere ruotato intorno al paziente, offre la possibilità di utilizzare tipi innovativi di posizionamento del soggetto da trattare per la terapia con protoni sia in posizione sdraiata che eretta"*.



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Il prototipo, basato sulla tecnologia ASG già utilizzata per il sistema MROpenEVO, unica MRI al mondo con design completamente aperto e tecnologia superconduttiva MgB2 cryogen free, sarà utilizzato per dimostrare attraverso studi scientifici il valore aggiunto di questa nuova modalità di trattamento dei tumori nel torace, nell'addome e nella pelvi. Lo sviluppo e l'installazione oltre che la messa in esercizio sono stati possibili grazie alla stretta collaborazione con partner tecnologici e industriali internazionali come ASG Superconductors che, oltre ad essere il produttore del dispositivo per la risonanza magnetica utilizzata come base, detiene storiche competenze nello sviluppo, progettazione e realizzazione di magneti superconduttivi MRI da 0,5T fino all'Ultra Alto Campo 11.7T, mentre la società MagnetTx Oncology Solutions, Edmonton/Canada, ha progettato la parte tecnologica rotante.

Marco Nassi, CEO – ASG Superconductors ha dichiarato *“È molto sfidante contribuire ad un progetto tecnico e scientifico così innovativo nel settore della protonterapia in stretta collaborazione con Ospedali, partner e Università di assoluto prestigio. Siamo, a maggior ragione, molto orgogliosi che le nostre tecnologie e competenze in termini di materiale superconduttore MgB2, magneti e sistemi MRI possano fornire un contributo sostanziale nel rendere in un futuro prossimo più efficaci le cure dei tumori”*.

Per ulteriori informazioni su ASG

www.asgsuperconductors.com

Per ulteriori informazioni sulla tecnologia open MRI MgB2

www.mropenevo.com

Per ulteriori informazioni su Oncoray e il progetto scientifico

<https://www.oncoray.de/>