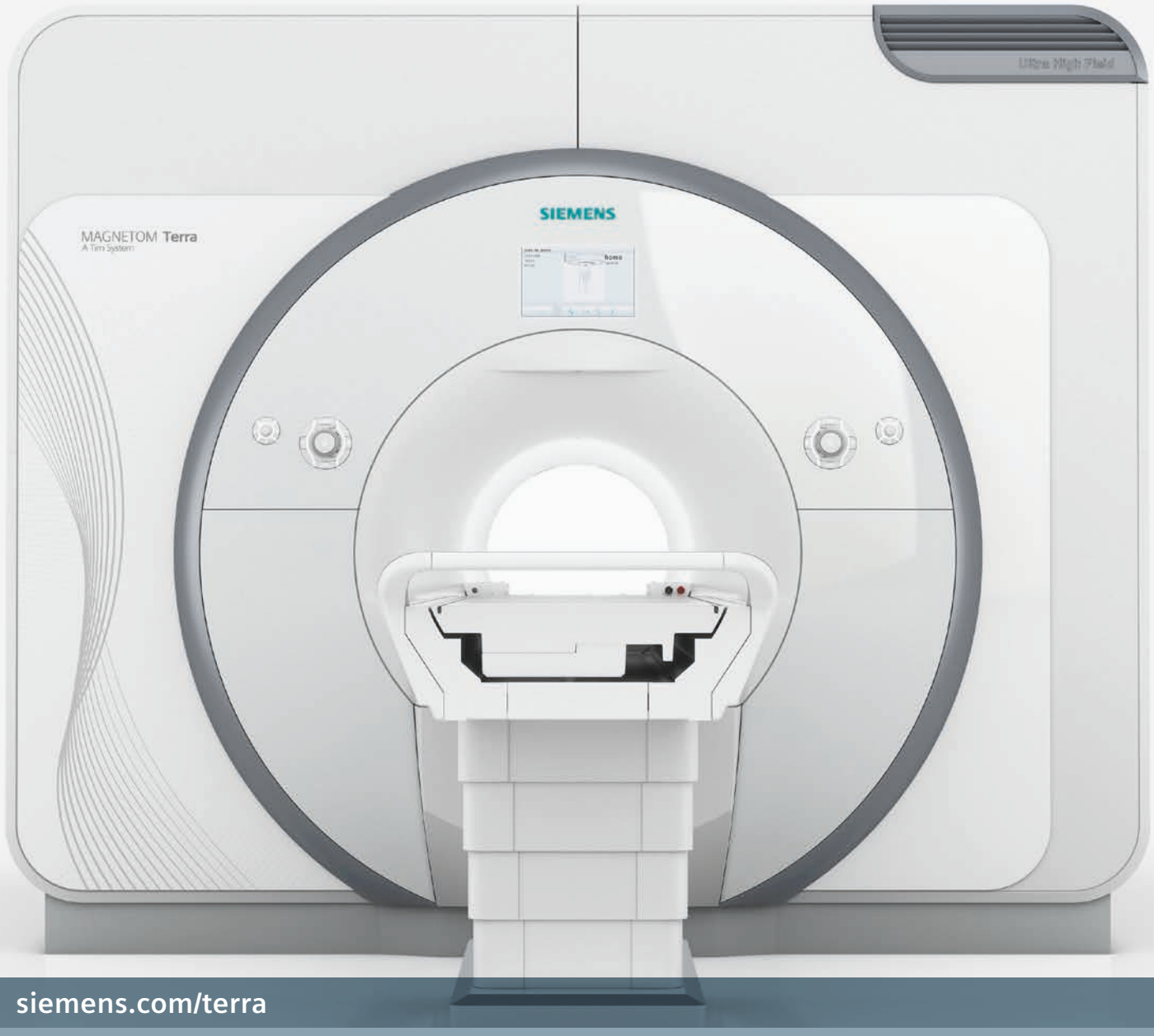
SIEMENS



siemens.com/terra

MAGNETOM Terra

Uncover what lies behind Siemens’ leading MRI technology.

MAGNETOM Terra[7]
Translate 7T research power into clinical care

Tim Technology

Deliver exceptional image quality and speed in MRI

DotGO Workflow

Go for consistent results, efficiently

Trendsetting Applications

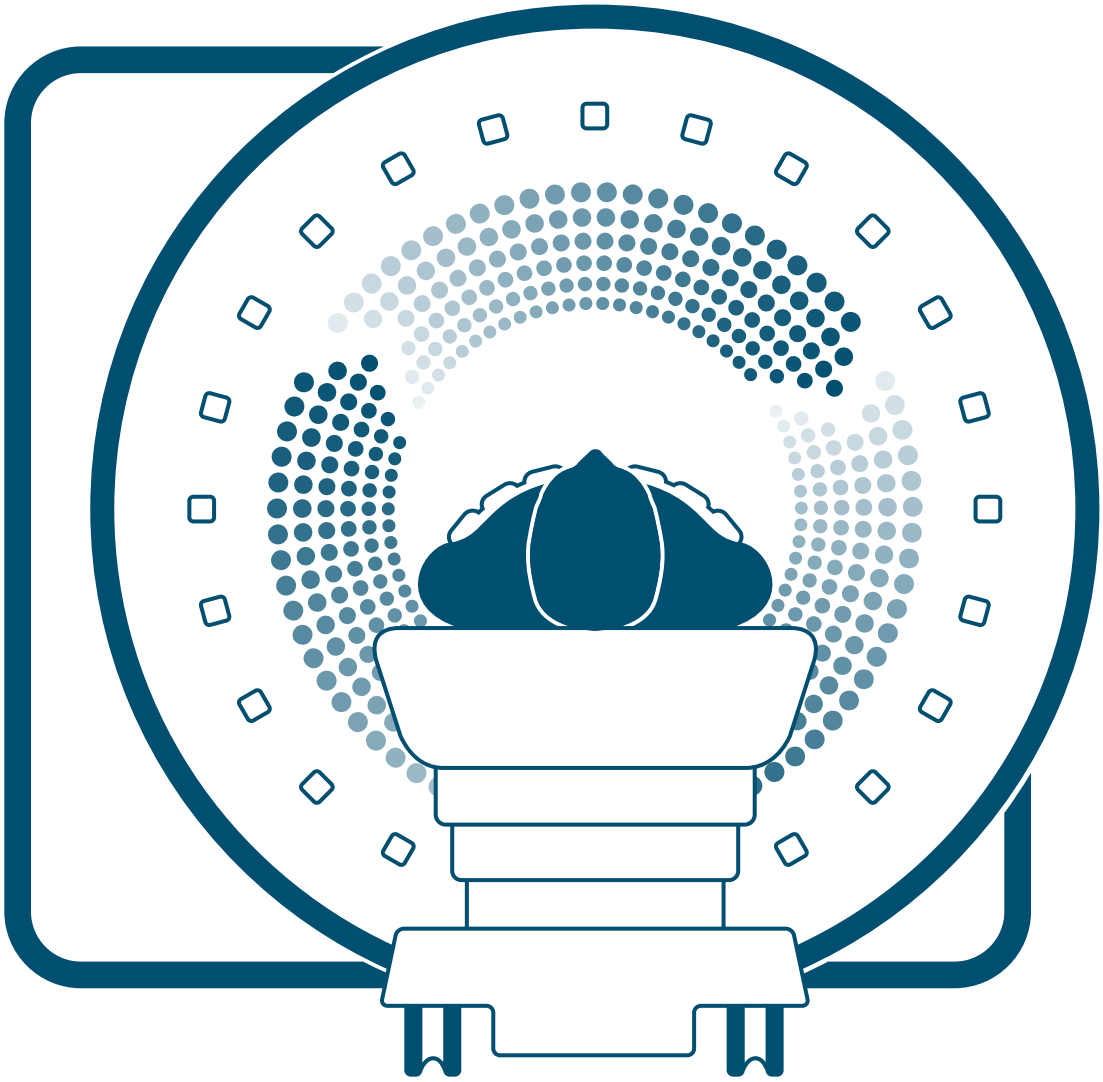
Expand your MRI services

Life Design

Maximize patient friendliness and investment protection

The DNA of Siemens MRI

An intensifying demographic shift, the rise of chronic diseases, patients turning into consumers, the pace of innovation and a broader access to medical imaging across the globe lead to a constantly growing number of examinations, including MRI. At the same time this development raises central questions for you as healthcare- and us as



equipment-provider alike: How to manage volume growth with limited resources? How to control costs without compromising quality of care? How to expand services in either established or growing markets? How to continuously strive for clinical excellence in the interest of patients despite economic restraints?

Siemens MR provides answers to these questions by offering a unique combination of MRI technology, software and clinical applications, supporting you in turning these challenges into opportunities.

MAGNETOM Terra^{7}
Translate 7T research power into clinical care

MAGNETOM Terra^{7} is designed to let you explore new territories in MRI by enabling powerful 7T research and enhancing clinical care. This advanced ultra-high-field (UHF) technology has the potential to keep you at the cutting edge of MRI, to attract the brightest minds to your facility, sharpen your competitive edge and strengthen your reputation. It delivers a fertile platform for unlocking research capabilities, publishing new insights first, and setting the pace in diagnostic imaging. Welcome to an exclusive research community. Welcome to a whole new world in MRI. Welcome to MAGNETOM Terra^{7}.

Contents

MAGNETOM Terra[7]
Translate 7T research power into clinical care

64 channels, 80/200 gradients and 8-channel pTX

- Higher acceleration factors with 64 receive channels
- More power for greater diffusion MRI and functional MRI with 80/200 gradients
- Higher homogeneity for challenging body regions with 8-channel parallel transmit (in research mode)

Double SNR for more precision

- 0.2 mm in-plane resolution to visualize previously unseen structures
- 0.14 cm^3 voxel sizes for metabolic brain mapping[1] (in research mode)
- Submillimeter BOLD fMRI precision to visualize sub-cortical activations

50% lighter 7T magnet technology

- Planned for CE and FDA authorization to market and therefore for clinical use
- Lower weight and cold-shipment for easier integration in clinical environments
- Reduced operating costs thanks to Zero Helium boil-off

>65% global market share in 7T technology

- Over 65% of 7T and 100% of vendor-integrated > 7T MRI human scanners worldwide from Siemens
- 6 of the 15 leading US hospitals use 7T MRI – and all 6 trust Siemens' technology[3]
- 64% of ISMRM UHF abstracts in 2014 were based on data from Siemens UHF systems[3]

The world's largest UHF community

- Largest installed base for exchanging ideas in a strong collaborative network
- An opportunity to enhance your reputation and competitiveness
- Incentive for the brightest minds in the MRI community to work with you

Unlock research beyond clinical limits

When it comes to research, the freedom to push the boundaries is imperative for gaining a competitive edge. For neuroscience and clinical research applications, MAGNETOM Terra^{7} delivers ultra-high SNR and 8-channel pTX for imaging challenging body regions. In addition, it has up to 64 receive channels for higher acceleration factors and 80/200 gradients for maximum flexibility. Moreover, this powerful, reliable scanner supports basic research by helping you develop groundbreaking technologies, set new trends and translate your outcomes into clinical routine.

Unlock research beyond clinical limits

with 8-channel parallel transmit

80/200 gradients and 64 receive channels for more research power

0.14 cm³ voxel size in spectroscopy for metabolic brain mapping[1]

8-channel pTX for higher homogeneity

Open platform architecture for own developments

Enhanced images with pTX
Image quality and speed are key, but inhomogeneities may present challenges, for example, in body MRI. MAGNETOM Terra's[7] 8-channel pTX technology helps you overcome these issues and generate images of excellent quality. This particularly promising technology has the potential to support your own hardware developments.

More power for your research
MAGNETOM Terra[7] offers a host of cutting-edge research functionalities, providing access to works in progress and powerful hardware configurations. 80/200 gradients and up to 64 receive channels deliver enhanced capabilities for your studies. What's more, the scanner gives you the freedom to explore and develop new clinical applications only possible at ultra-high-field strengths.

"The increased spatial resolution offered by 7T MRI enables us to study fine-grained activation patterns within cortical areas and investigate detailed functional topography of the cerebral cortex in individual human subjects. This will provide us with a deeper understanding of the human brain and its connectomics in healthy and diseased populations."[4]

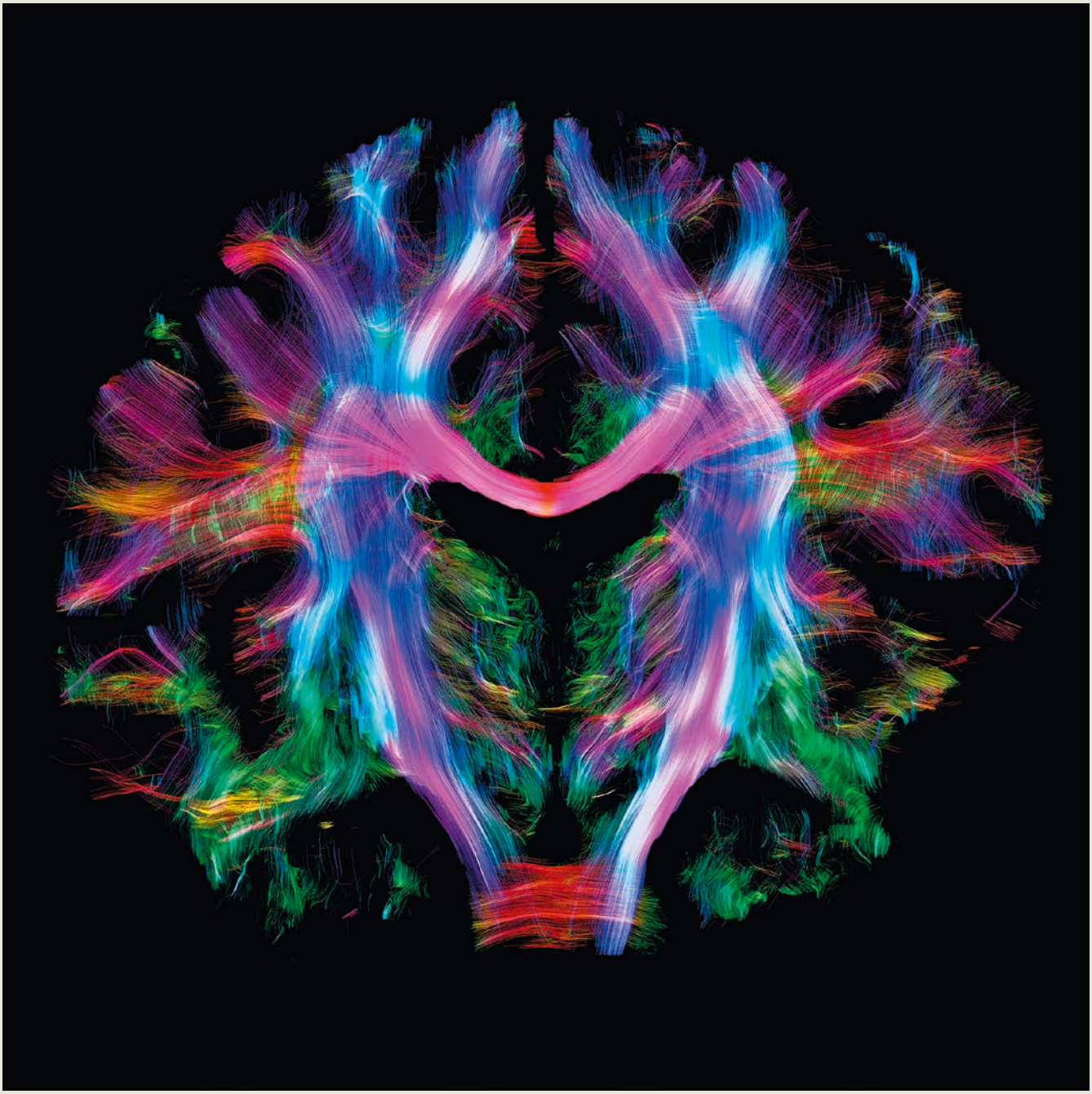
Professor Kamil Ugurbil
Director of the Center for Magnetic Resonance Research (CMRR),
Minneapolis, Minnesota, USA

Ultra-high resolution spectroscopy

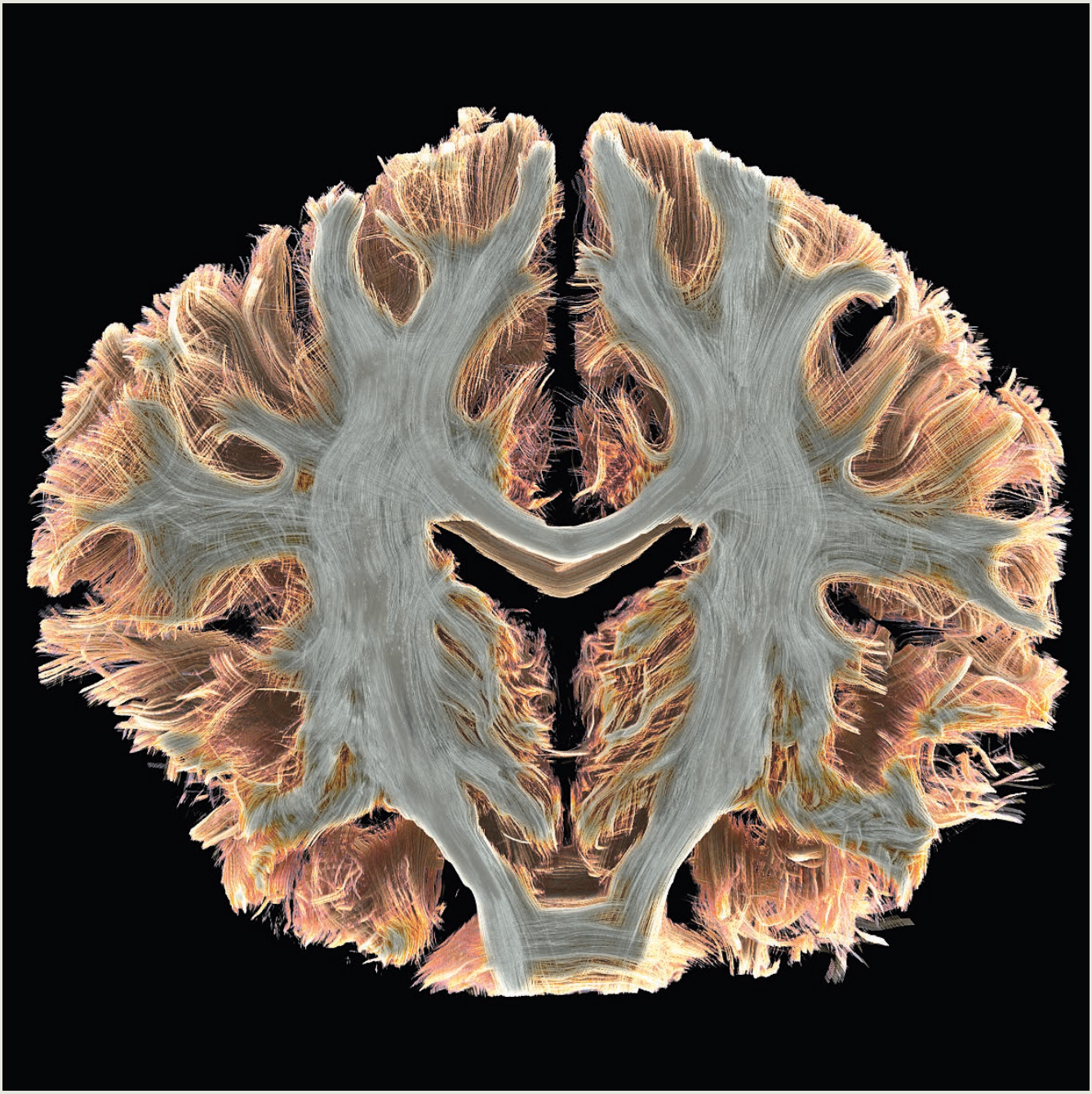
Proton magnetic resonance spectroscopy at 7T not only delivers metabolic information, but also gives accurate anatomical insight. Ultra-high 0.14 cm^3 resolution has the potential to reveal valuable new diagnostic information for clinical applications – including patients with tumors, epilepsy, multiple sclerosis or other neurodegenerative diseases.

Open platform architecture

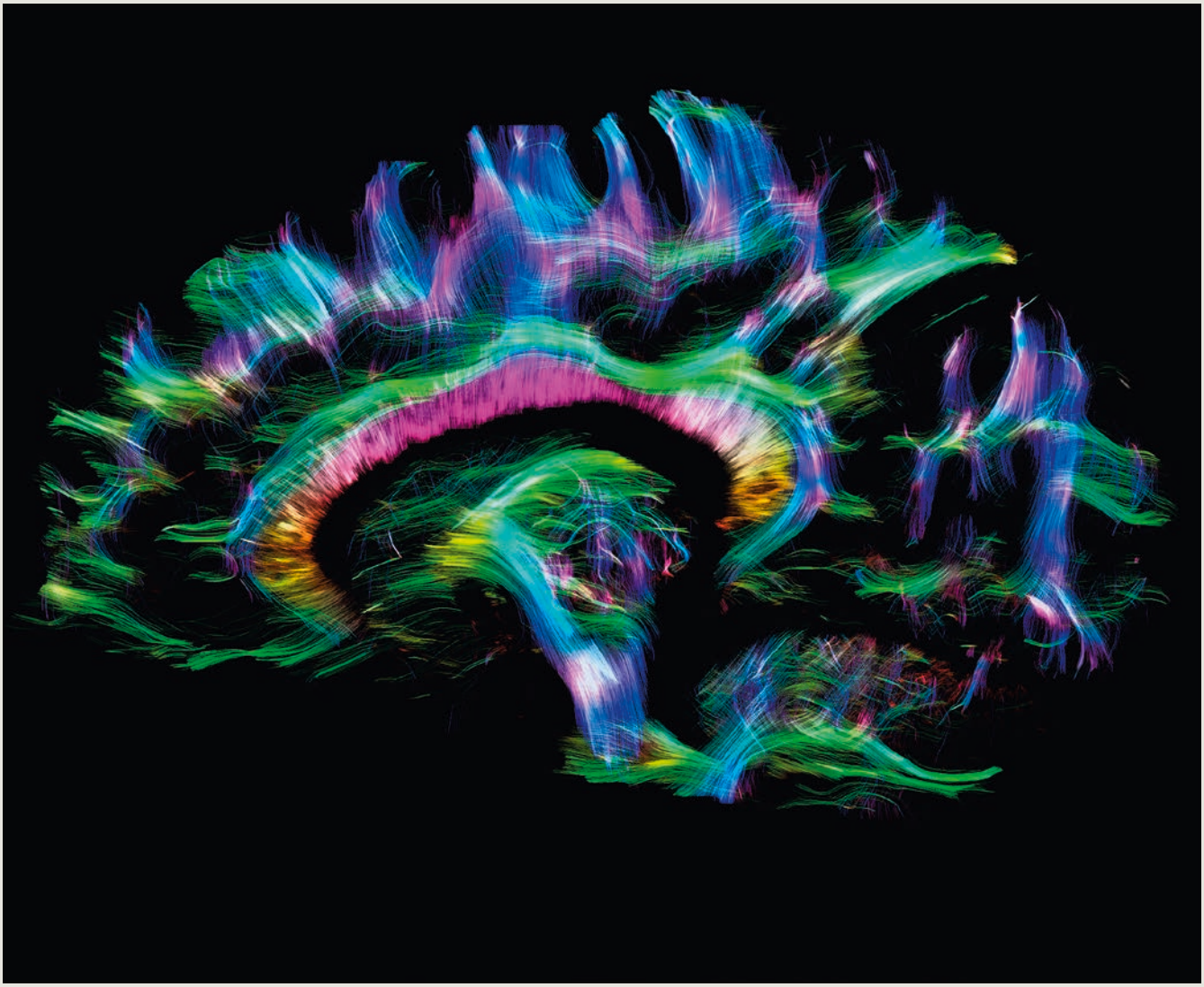
MAGNETOM Terra[7] provides flexible, fertile ground for your own UHF hardware and software developments. For example, Siemens collaboration partners benefit from technical support and direct access to the sequence, the Image Calculation Environment (ICE), and imaging protocols.



Transparent fibers: Tracks calculated with spherical deconvolution based on diffusion-weighted EPI acquisitions with 1 mm isotropic resolution covering the whole brain. The high SNR provided by 7T allows resolving crossing fibers in many brain sub-regions.
Max Planck Institute, Leipzig, Germany



In-vivo histology: *syngo*.via Frontier, the research extension of *syngo*.via, helps bridge the gap in post-processing translational research. Cinematic rendered images based on MR data sets may be used for patient counseling, surgery planning, or teaching purposes.[5]



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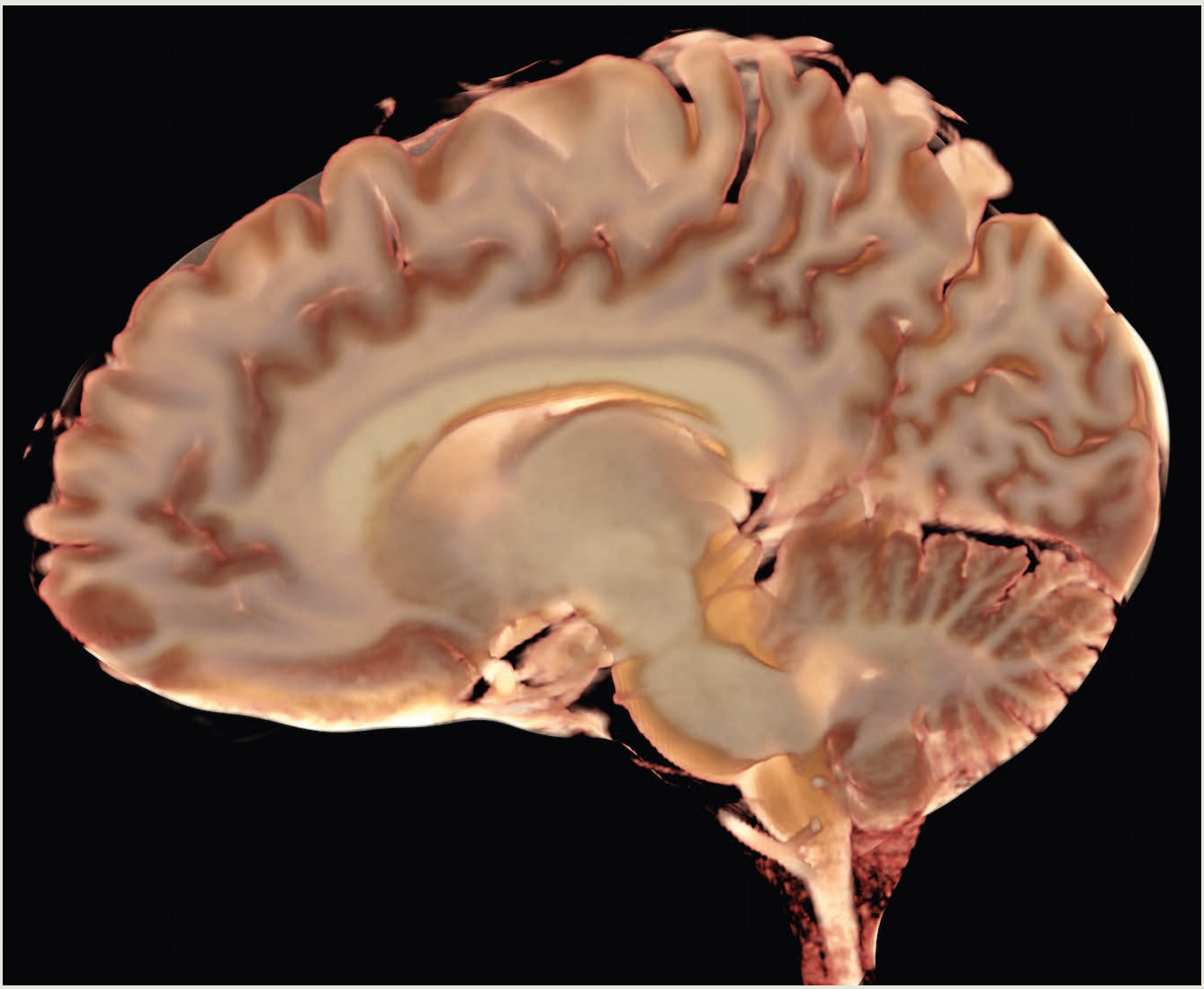

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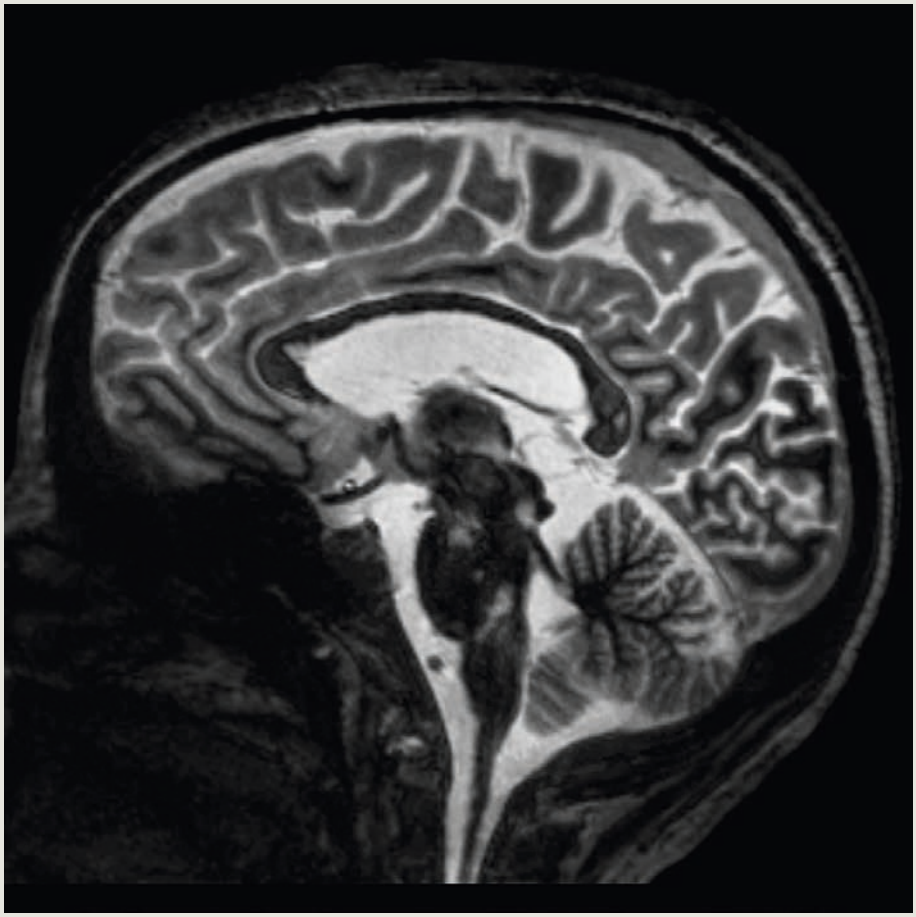
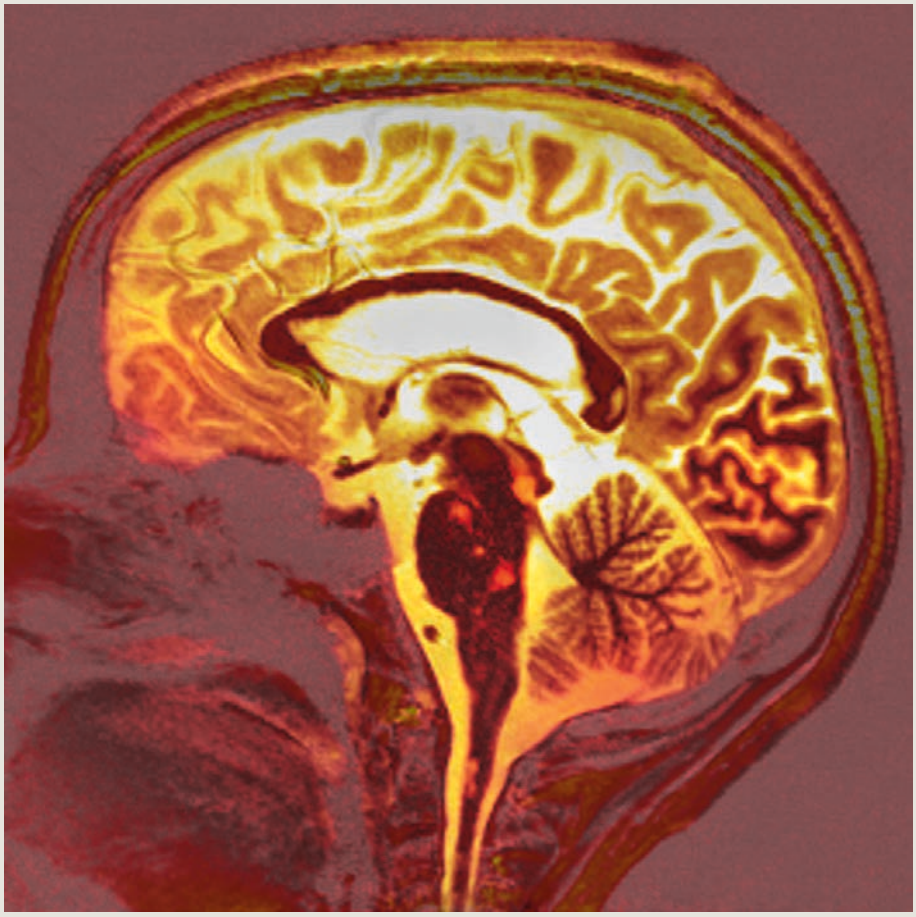
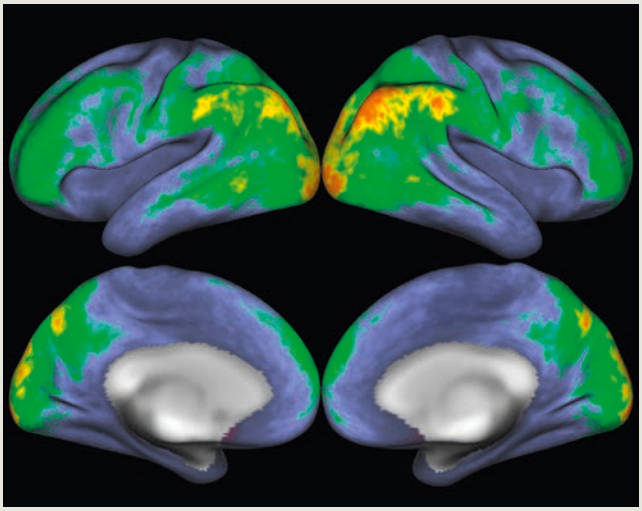


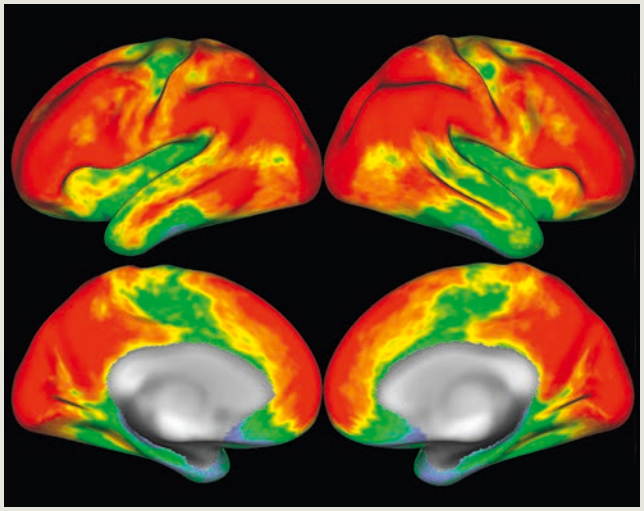
Parallel transmit on Multiple Sclerosis (MS) patient:
3D MP2RAGE at 0.75 mm isotropic resolution revealing MS lesions in the brainstem. The parallel transmit functionality increases the homogeneity in areas of cerebellum and brainstem.
Robarts Research Institute, London, Canada



A fused image with different contrasts can be used to enhance the visibility of MS lesions.
Robarts Research Institute, London, Canada



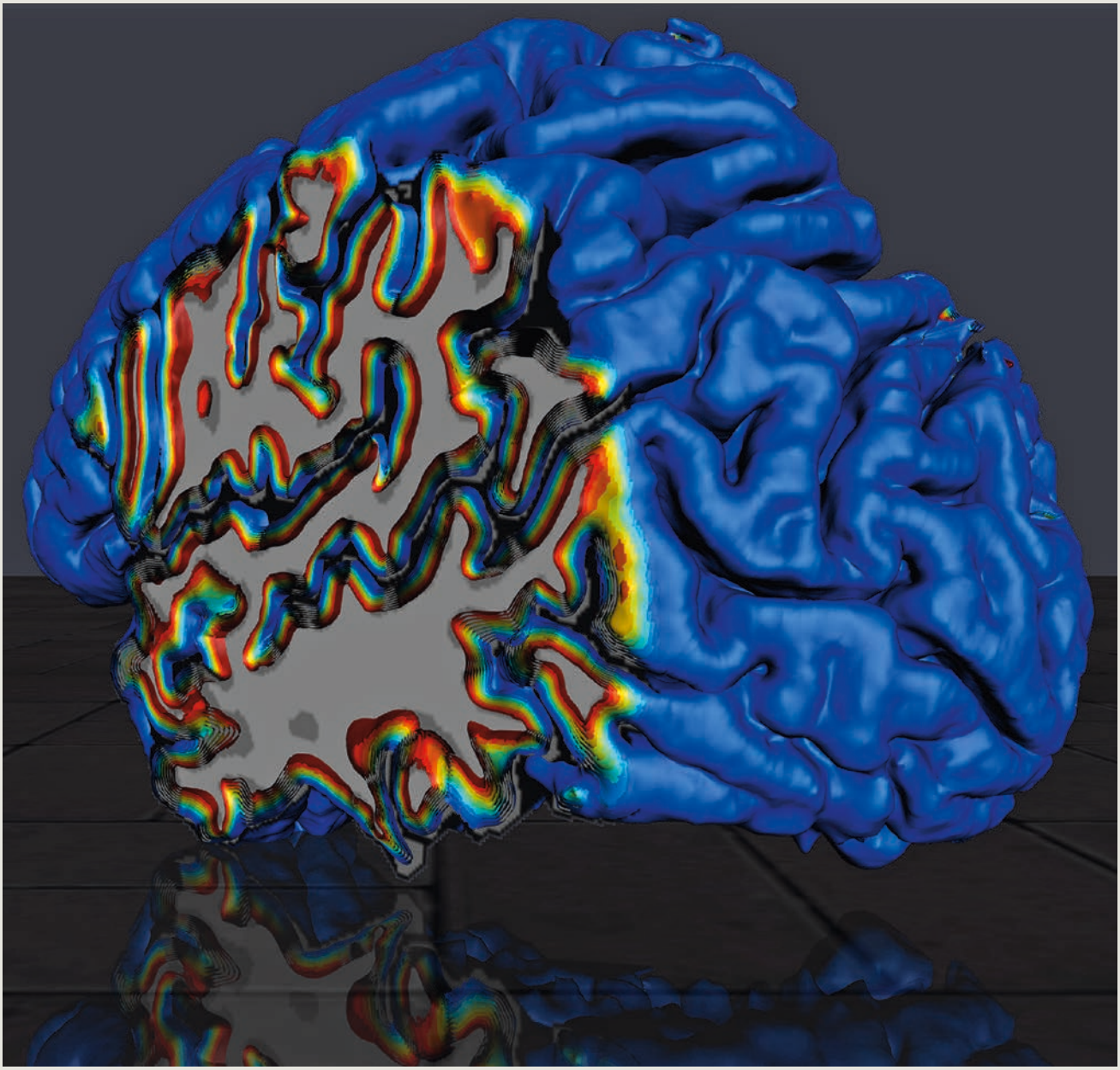
3 Tesla



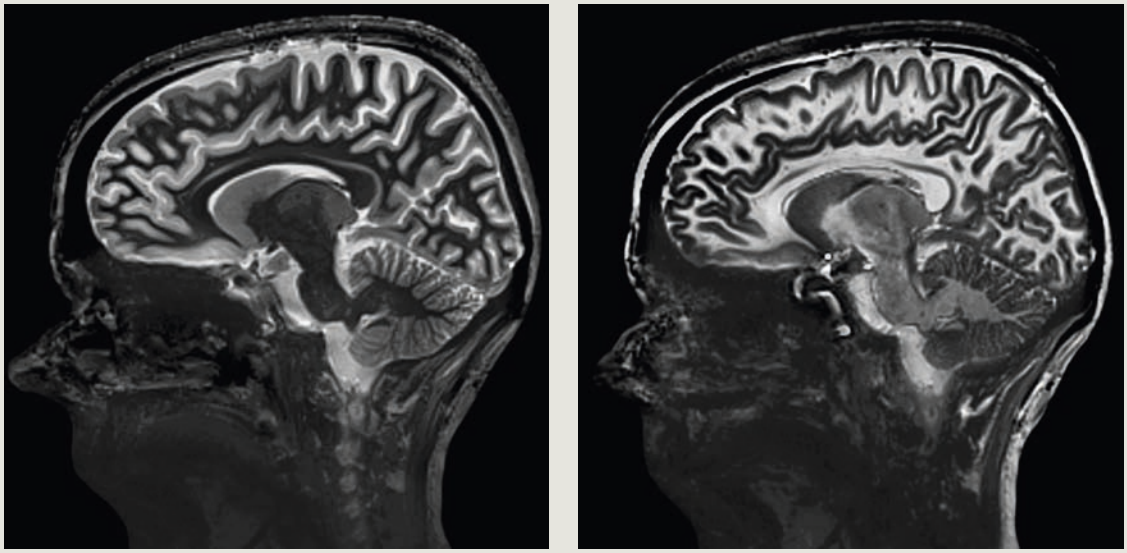
7 Tesla

Functional MRI: Contrast-to-noise ratio maps in resting state fMRI.

Consortium The Human Connectome Project. CMRR, Minnesota, USA – Washington University St.Louis, USA – Oxford University, UK



Depiction of cortical layers: Post-processed high-resolution anatomical MR data reveals reconstructed surfaces at different cortical depth levels. The inner red surface runs along the white/gray matter boundary. The outer blue surface runs along the outer (pial) boundary of the cortex.
Scannexus, Maastricht, The Netherlands

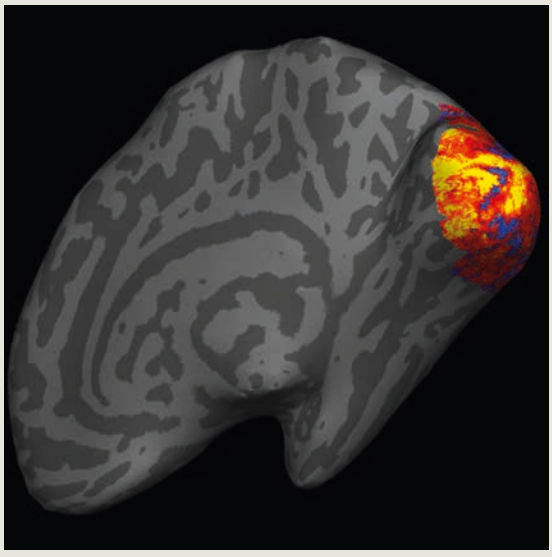


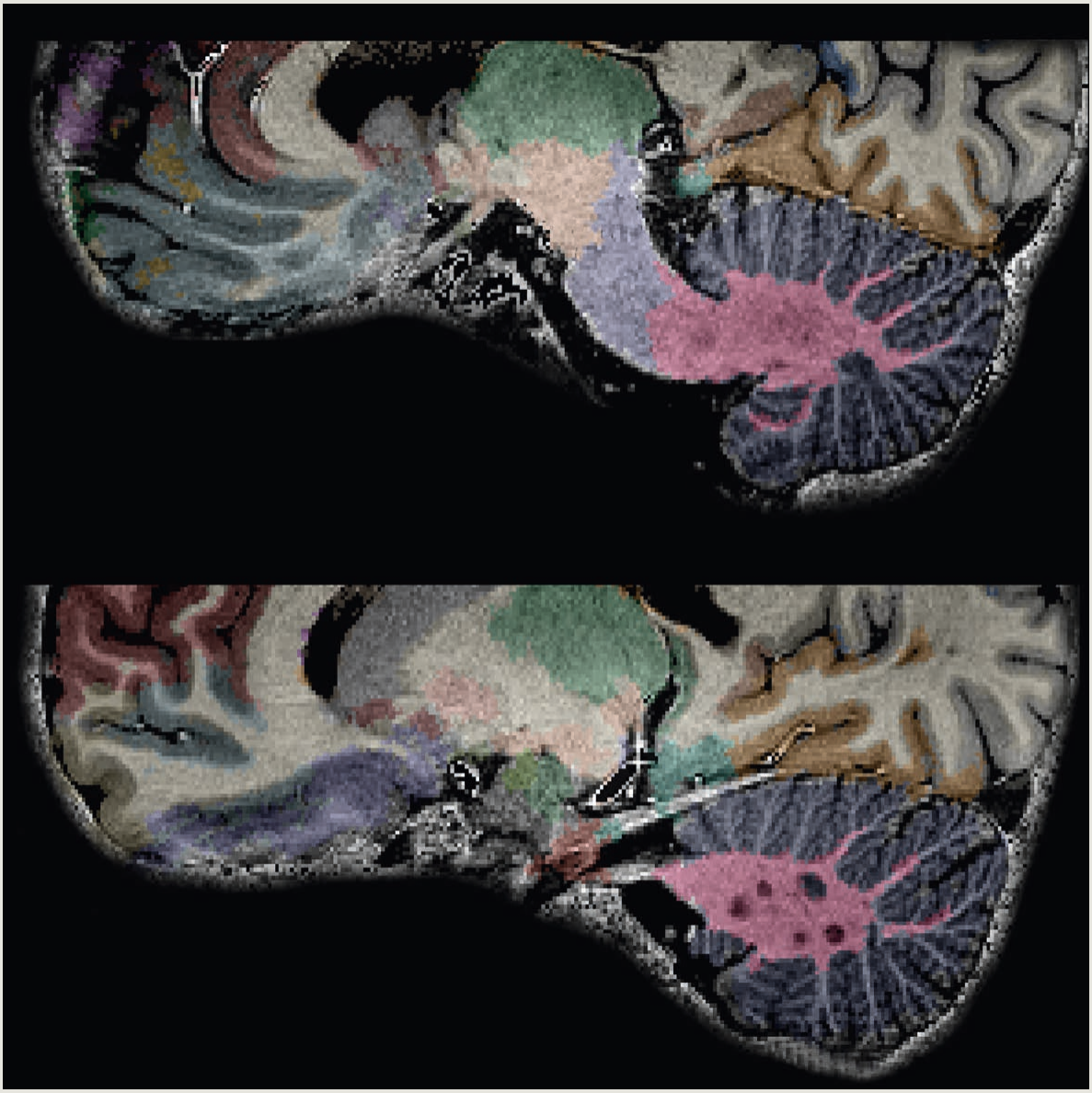
Tissue segmentation: Delineation of subcortical nuclei in the thalamus and brainstem at 1 mm isotropic resolution. White matter nulled MPRAGE (left TA 8:52 min) and gray matter nulled MPRAGE (right TA 10:38 min).
MGH, Boston, USA

"Siemens provides the best possible open hardware and software environment to explore these new transmit and receive concepts, all of which have proved essential to allow ultra-high fields to fulfill their potential for the benefit of human health."[4]

Professor Lawrence L. Wald, Director, MGH NMR Core at Martinos Center, Department of Radiology, Boston, Massachusetts, USA

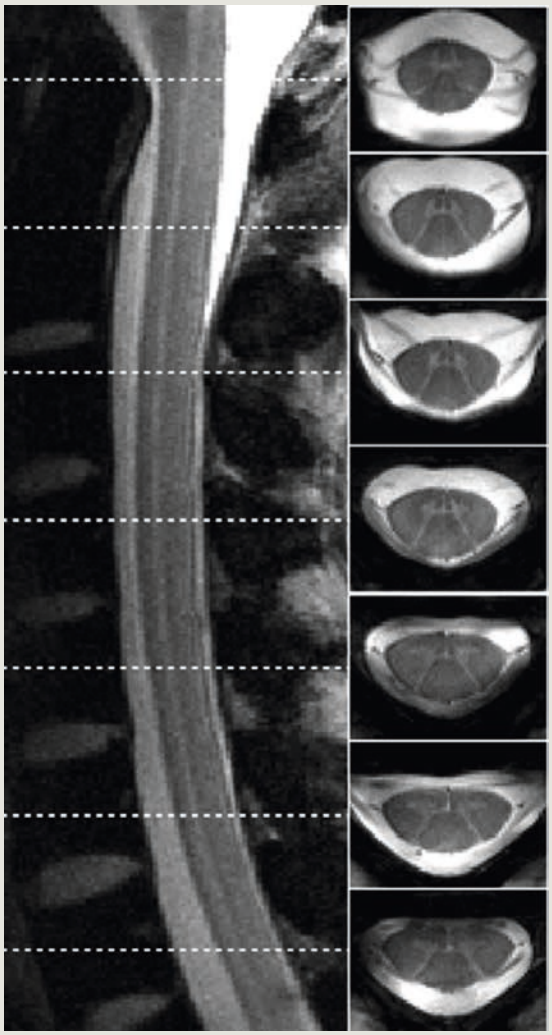
High-resolution fMRI: Cortical-layer-specific activation with fMRI at 1 mm isotropic resolution, inflated view. The fMRI visual stimulus was designed to activate a pattern in the shape of the number "7" using the known retinotopic mapping in the human visual cortex.
MGH, Boston, USA





Segmentation of the cerebellum:
High-resolution example of an MS-patient case. 3D MP2RAGE (0.57 x 0.57 x 0.58 mm^3).

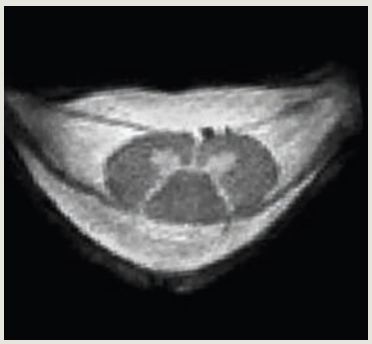
Clinical Neuroscience LREN-LTS5/CHUV – CIBM, Lausanne, Switzerland



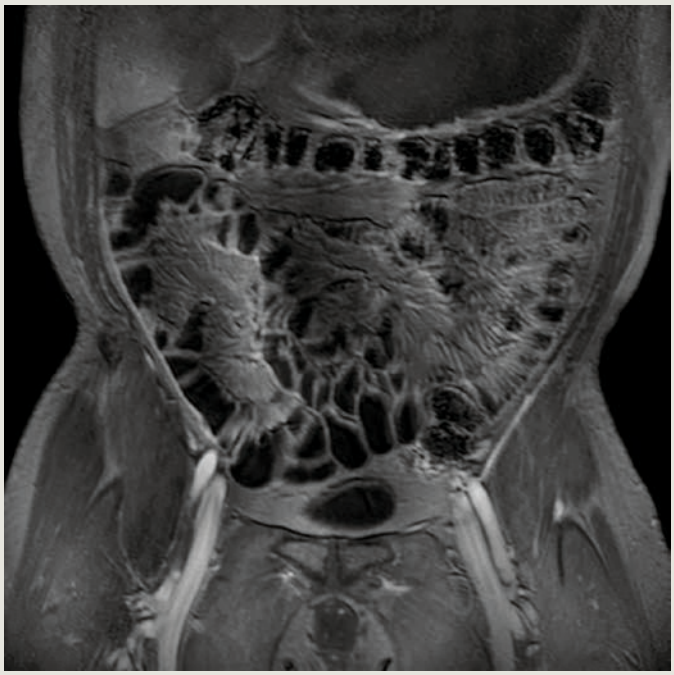
Spine imaging: Ultra-high resolution of the cervical spine using a custom-built spine coil.
MGH, Boston, USA

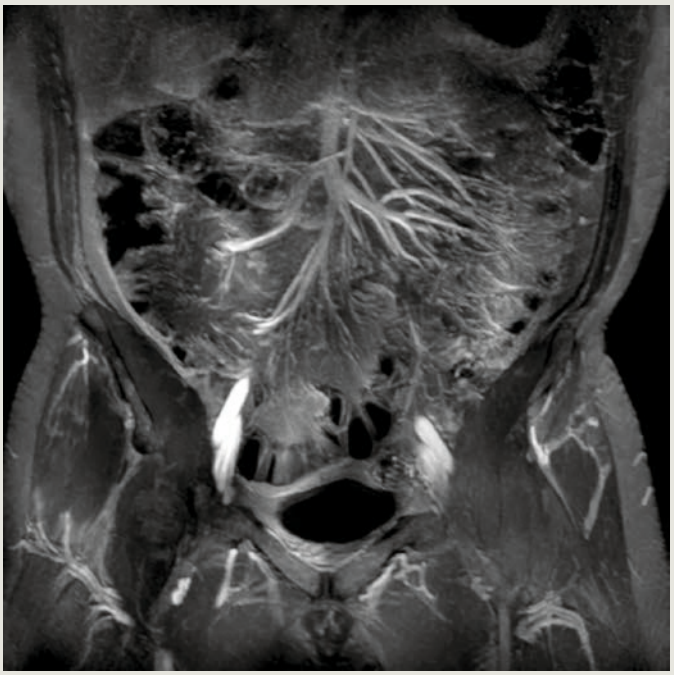
3 Tesla: 0.5 mm in-plane

7 Tesla: 0.5 mm in-plane



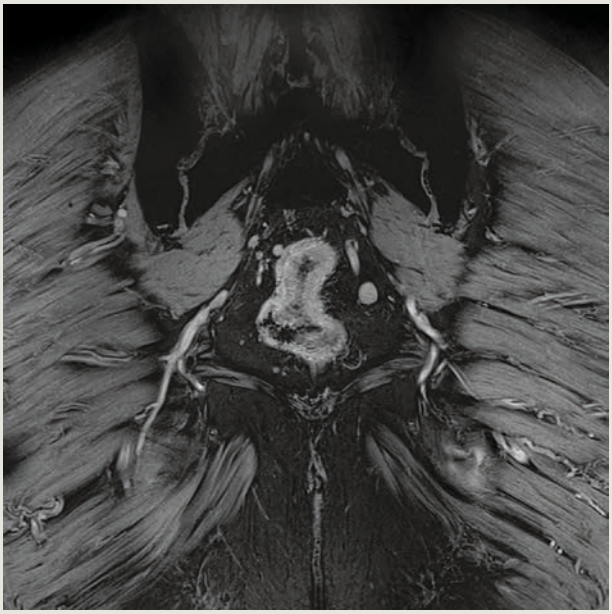
7 Tesla: 0.3 mm in-plane



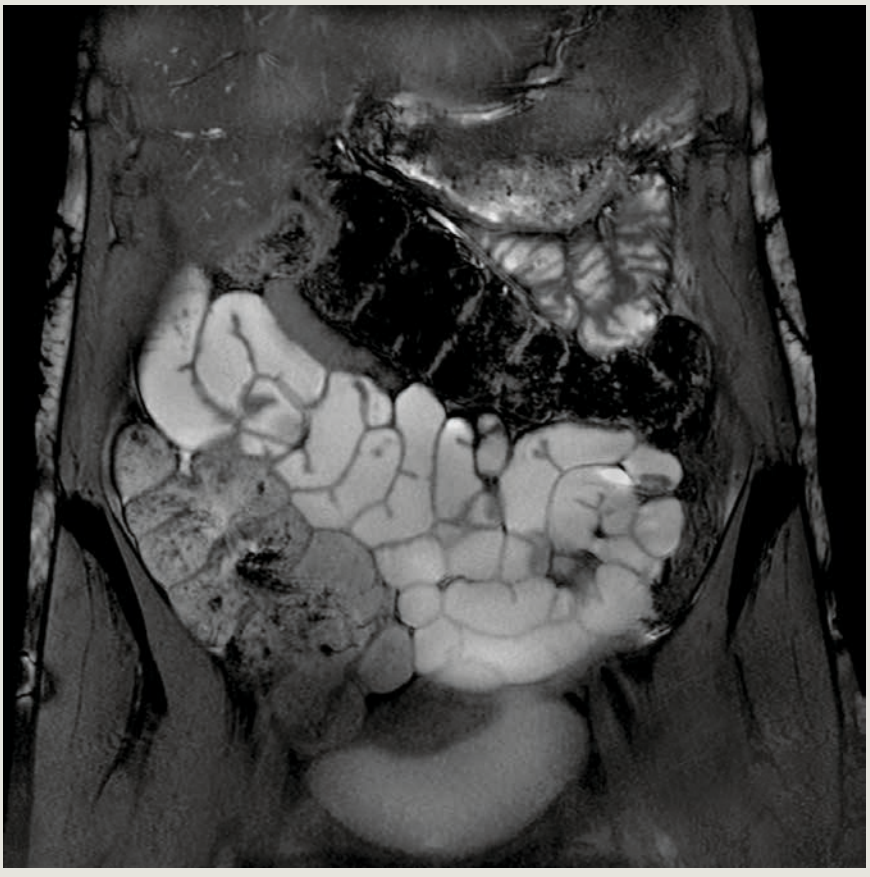


Body imaging: Left image, 3D VIBE FatSat, right image, thin MIP from the 3D VIBE FatSat. Images acquired using pTX and custom-built coils.

Erwin L. Hahn Institute for MRI, Essen, Germany

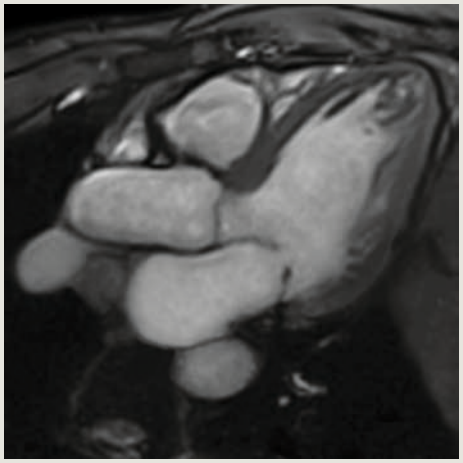


Body imaging:
Image above, rectum carcinoma imaged with a ce-FLASH (0.3 x 0.6 x 2 mm^3, TA 2:14 min). Images acquired using pTX and custom-built coils. Image below, abdominal small bowel imaging with TrueFISP (0.4 x 0.8 x 2 mm^3, TA 26 s).
Erwin L. Hahn Institute for MRI, Essen, Germany

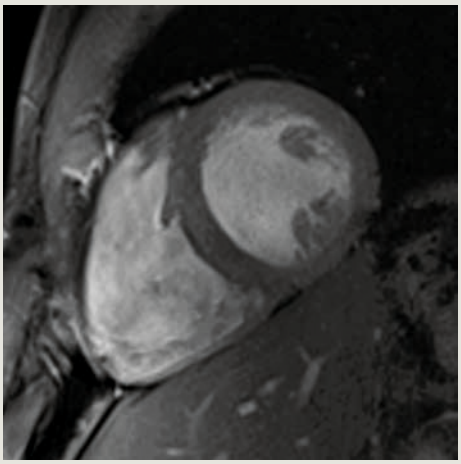


Cardiac imaging: Accelerated T1-weighted FLASH acquisitions.

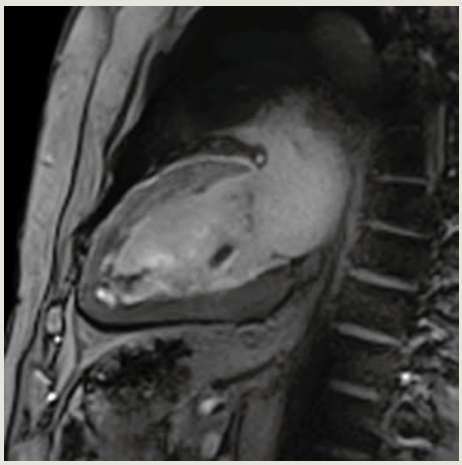
Berlin Ultrahigh Field Facility, Berlin, Germany



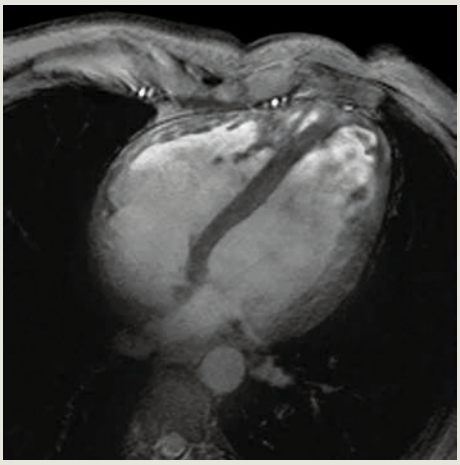
Right ventricular output tract: FLASH cine retro (1.3 x 1 x 4 mm³, SENSE 2, TA 13 s).



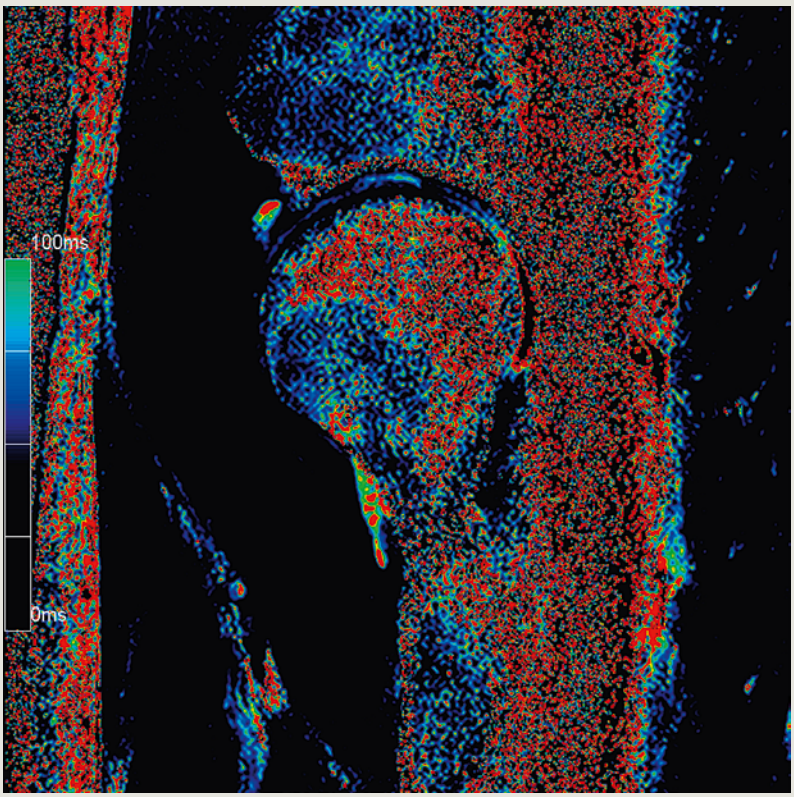
Short axis view: FLASH cine retro (1 x 1 x 4 mm³, GRAPPA 2, TA 18 s).



Two chamber view: FLASH cine retro (1.2 x 1 x 4 mm³, SENSE 2, TA 13 s).

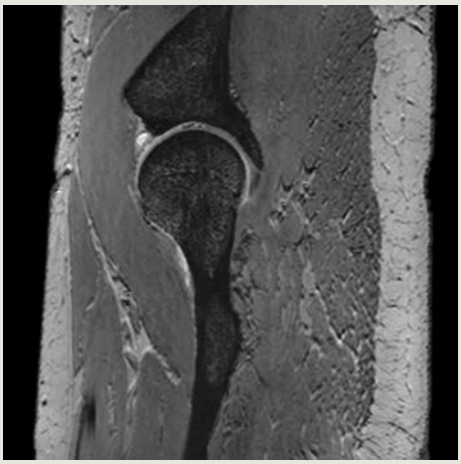


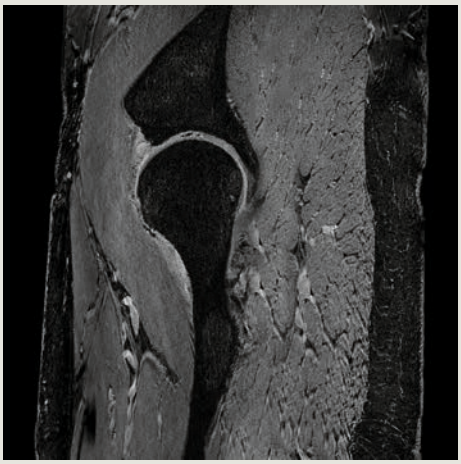
Four chamber view: FLASH cine retro (1 x 1 x 4 mm³, GRAPPA 2, TA 16 s).



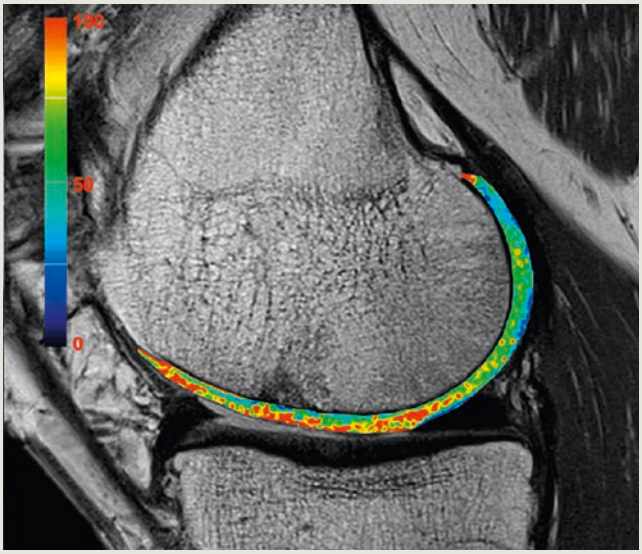
Hip cartilage transplant:
Cartilage transplant visible in 3D DESS (0.37 x 0.74 x 0.74 mm^3, TA 5:11), 3D VIBE SPAIR (0.19 x 0.39 x 0.8 mm^3, TA 5:58) and T2 MapIt (0.25 x 0.5 x 2.5 mm^3, TA 4:47) 14 months after Autologous Chondrocyte Transplantation (ACT).

Erwin L. Hahn Institute for MRI, Essen, Germany

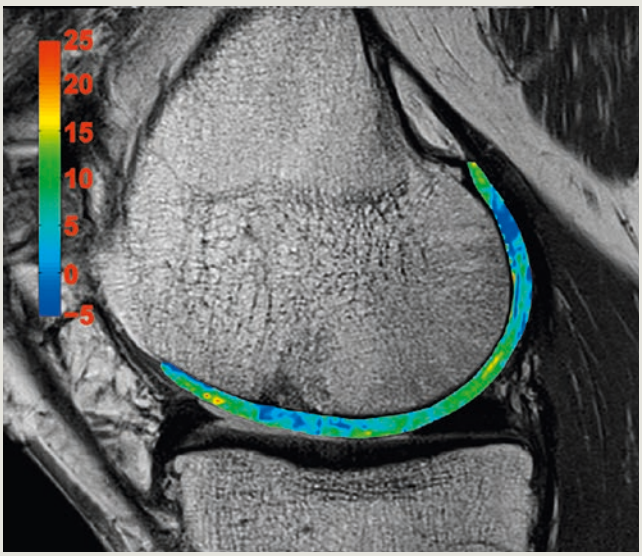




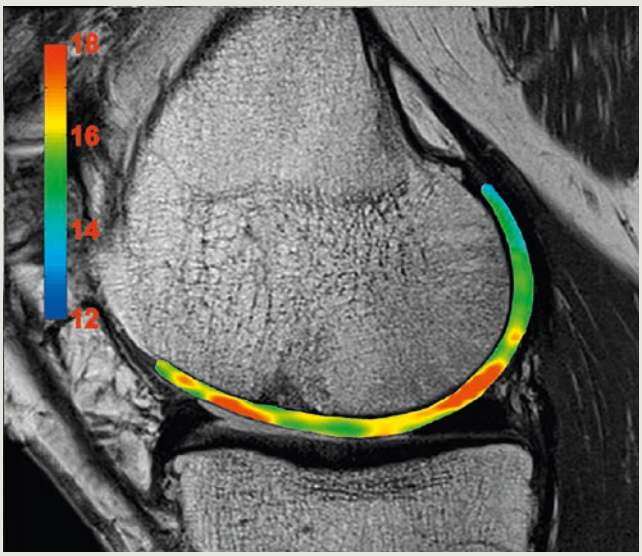
Morphologic PD TSE (0.4 x 0.4 x 2 mm³).



T2 map (0.6 x 0.6 x 1 mm³), T2 in ms. More water, disturbed collagen architecture visible.



gagCEST image (0.7 x 0.7 x 3 mm³)
gagCEST asymmetries in [%]: lower values, less PG content.

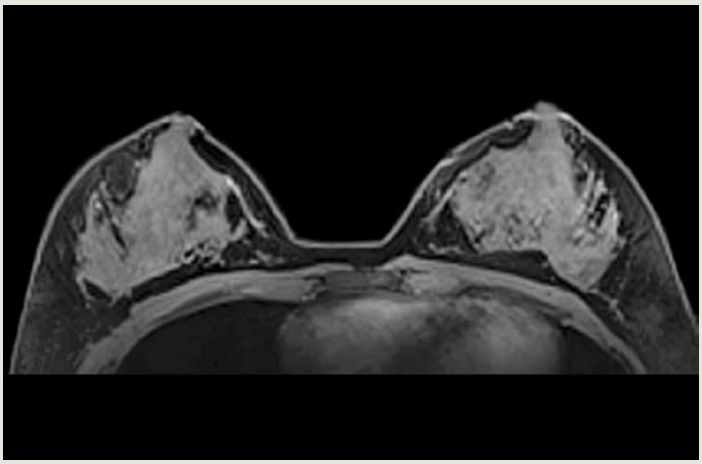


Sodium image. Sodium SNR: lower values, less PG content.

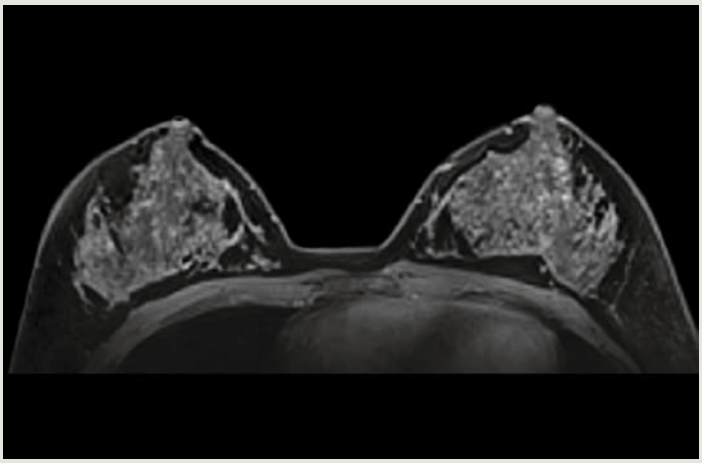
Biochemical imaging using CEST: Male patient nine years after Autologous Osteochondral Transplantation (AOT) in the medial femoral condyle. MedUni Wien, Vienna, Germany

Breast imaging: High-resolution bilateral breast imaging in short acquisition time. Pre- and post-contrast 3D FLASH SPAIR, 1.4 mm isotropic resolution, TA 1:48 min/series.

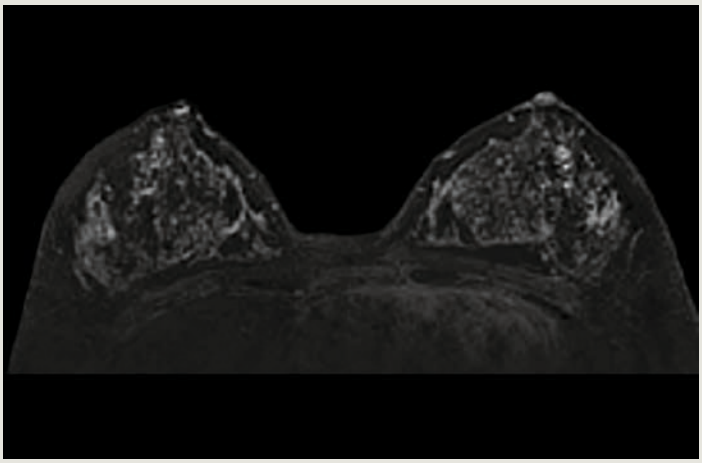
NYU Langone Medical Center, New York, USA



Pre-contrast



Post-contrast



Subtraction

Change the game in UHF business

Medical research funding has stagnated in the last decade. Ensuring your high-end MRI endeavors have the right business impact is crucial in today's competitive environment. MAGNETOM Terra^{7} is the result of over 25 years of Siemens UHF innovations, culminating in the design of a brand-new, volume-produced 7T magnet. The magnet is 50% lighter than previous generations and supports easier integration into clinical environments. MAGNETOM Terra^{7} can help you become more competitive, while making a tangible difference to clinical care, research – and your business.

Change the game in UHF business

with Siemens' 50% lighter 7T magnet

Zero Helium boil-off
for lower operational costs

Planned CE and FDA authorization to market

50% lighter magnet technology

Lower weight and cold-shipment for easy integration

Innovative magnet technology
Siemens' 7T magnet is a milestone in MR magnet technology. Its unique design and thermally balanced materials minimize physical interactions between core components. The result is 50% lighter than previous generations, with a higher structural stability and a greater fundamental stress capacity. In addition, excellent homogeneity makes for enhanced image quality.

Easy clinical integration
Thanks to the lighter magnet, the scanner can be shipped cold via airfreight. What's more, you benefit from up to 50% faster installation time and ramp-up. Zero Helium boil-off translates into lower lifecycle costs and an improved eco-footprint. All this has the potential to enhance performance, lower resource consumption, improve sustainability, and reduce operating costs.

"When you talk to other people in the field, it is clear that Siemens has by far the greatest expertise in ultra-high-field imaging."[4]

Professor Rainer Goebel,
University & Scannexus,
Maastricht, The Netherlands

Increased competitiveness

MAGNETOM Terra[7] can help you broaden research funding opportunities, making your institution stand out as a leader in life sciences. By being at the cutting edge of clinical care and research, you have the opportunity to increase competitiveness for grants, benefit from reduced complexity in clinical trials, and open up potential for clinical imaging reimbursements.

Foward-looking technology

An investment in MAGNETOM Terra[7] is an investment in the future. Siemens is committed to serving the ultra-high-field community – today and tomorrow – with a host of outstanding innovations. From development and production, to service – all of MAGNETOM Terra's[7] key components are delivered from a single reliable partner you can trust, for maximum peace of mind.

Courtesy: Universitätsklinikum Erlangen, Germany

April 2015 – Installation of Siemens' first 7T magnet: During the 30 years that we have been producing 1.5T and 3T magnets, we have gained extensive engineering skills and well-founded process expertise. This knowledge and experience has led to the development and production of our own 7T magnet.

Proven innovations in the development and production of magnet technology

1980
The world's first superconducting whole-body MRI

1989
The world's first 1.5T active-shielded magnet

1994
The world's first open MRI magnet

1997
The world's first 3T active-shielded magnet

2003
The world's first Zero Helium boil-off magnet (MAGNETOM Avanto)

2004
The world's first open-bore (70 cm) 1.5T magnet (MAGNETOM Espree)

2008
The world's first open-bore (70cm) 3T magnet (MAGNETOM Verio)

2010
The world's first PET-compatible magnet (Biograph mMR)

Best Factory Awards for Siemens Magnet Technology, Oxford (Process and Design)

2012
Best Factory Awards for Siemens Magnet Technology, Oxford (Best Engineering Plant, Supply Chain Award & Innovation Award)

2015
The world's first cold-shipped 7T magnet, 50% lighter (MAGNETOM Terra[7])

"MAGNETOM Terra[7] is the first 7 Tesla MRI scanner fully designed and manufactured by Siemens, with a completely new 7 Tesla magnet in its core. Siemens Healthcare's factories are home to the largest MRI production worldwide of 1.5 Tesla and 3 Tesla systems. Now, they are also home to the new MAGNETOM Terra[7] – our new 7 Tesla system with a 7T magnet that is 50% lighter than previous generations. MAGNETOM Terra[7] is about exploring new territories in MRI research and at the same time it's the world's first 7 Tesla scanner designed for clinical use."[4]

Dr. Bernd Ohnesorge,
CEO, Siemens Healthcare, Magnetic Resonance,
Erlangen, Germany

Award-winning development and production: Siemens Magnet Technology in Oxford, UK, has received seven Best Factory Awards and seven Queen's Awards for Enterprise in multiple categories, including for processes and design.The facility deploys leading-edge supply chain management methods, and prides itself on reliable, robust production and the highest standards of quality.

Double SNR for more precision

Discovering new ground in MRI can help you significantly enhance patient outcomes. Imaging at 7T offers more than double the SNR of 3T. This delivers potential for better lesion conspicuity, faster image acquisition to reduce motion artefacts, and earlier disease detection at submillimeter resolution. MAGNETOM Terra[7] is planned for CE and FDA authorization to market and therefore for clinical use. Its Dual Mode lets you switch between clinical and research tasks, unlocking new opportunities and providing a solid, well-founded platform for innovative results.

Double SNR for more precision

with clinical applications in Dual Mode

Submillimeter BOLD
fMRI precision for pre-surgical evaluation

Ultra-fine 0.2 mm
anatomical resolution

Up to **20x** faster image reconstruction[6] and *syngo* MR E11

Switch between research and clinical tasks with **Dual Mode**

Dual Mode flexibility
MAGNETOM Terra[7] is the first 7T scanner intended for future clinical use. With planned CE and FDA authorization to market for selected neurological and musculoskeletal scan protocols, it has potential to uncover a whole new world of clinical care. Its unique Dual Mode functionality lets you switch between research and clinical operation, giving you flexibility to get more from your scanner.

Ultra-fine anatomical resolution
In brain and musculoskeletal MRI, 7T reveals details previously unseen at lower field strengths. For example, cerebral cortex imaging at 0.2 mm in-plane resolution may detect changes in cortical structure indicating early dementia. It also helps visualize cortical microinfarcts and plaques in MS patients and delivers insight into the plaque-vessel relationship and iron accumulation.

"Based on higher resolution, 7T provides new insights into gray and white matter disease in the brain, such as multiple sclerosis, focal cortical dysplasia and hippocampal sclerosis. Furthermore, functional MR benefits from 7T based on a clinically relevant increase in functional sensitivity and specificity. In musculoskeletal imaging, 7T enhances the visualization of small joint structures and subtle pathologies, such as small meniscal tears, triangular fibrocartilage lesions and early stages of cartilage degeneration."[4]

Professor Siegfried Trattnig,
Director of the MR Centre of Excellence,
MedUni Wien, Vienna, Austria

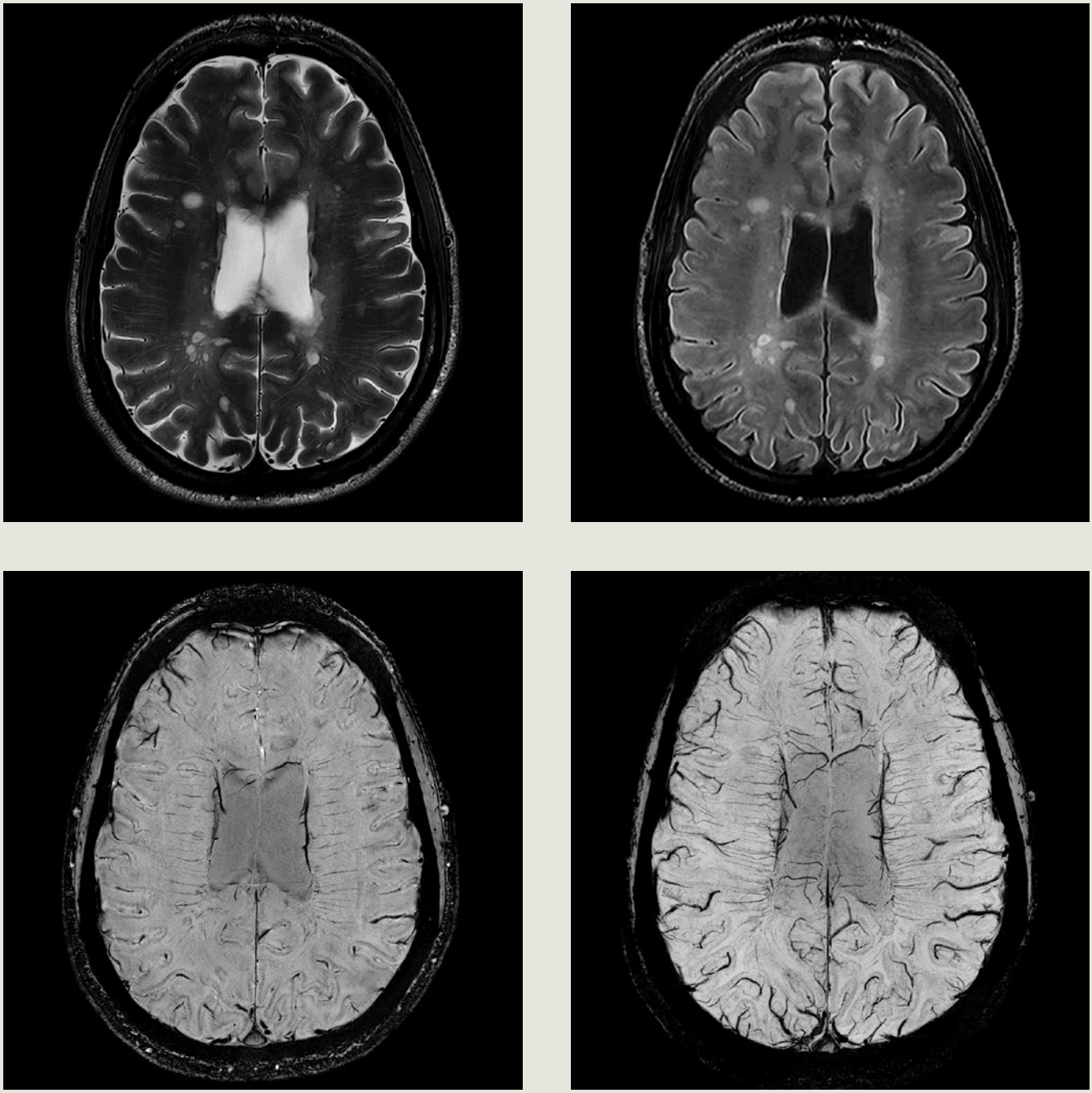
6 of the 15 leading US hospitals (2014 - 2015) already work with Siemens 7T scanners in their research endeavors.[3]

Submillimeter fMRI

The BOLD contrast increases linearly with field strength. In clinical use, this could mean higher precision in oncology compared to 3T applications, for example, through smaller voxel sizes. Potentially, this can increase the accuracy of neurological pre-surgical evaluation of eloquent areas before tumor removal, while keeping scanning times viable[2].

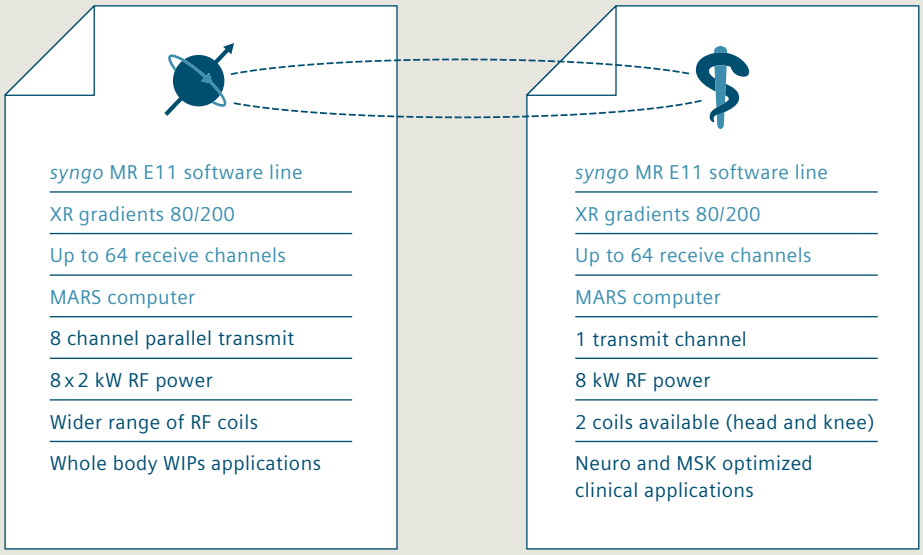
Powerful image reconstruction

MAGNETOM Terra[7] delivers improvements in workflow for easier operation and better patient handling. Leveraging the latest *syngo* MR E11 software platform, it lets you work in the same way as you do with cutting-edge 3T technology. What's more, it comes with the most powerful MARS technology ever built on a Siemens 7T scanner, for up to 20 times faster image reconstruction.[6]

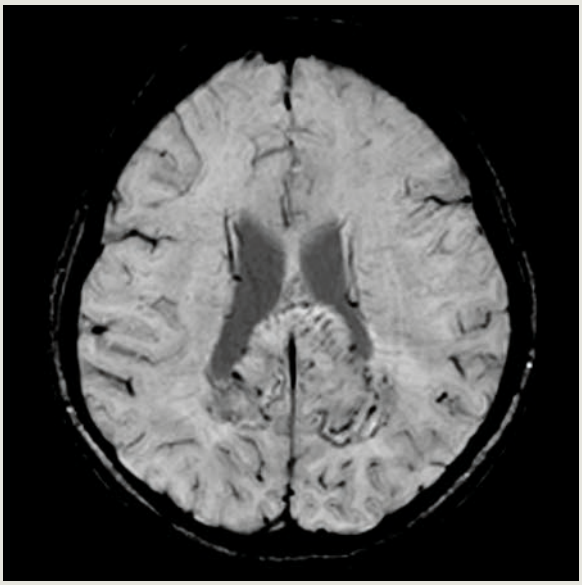


Multiple Sclerosis: MS lesions visible from top left to bottom right in T2 TSE (0.21 x 0.21 x 3 mm^3, TA 3:23 min), Dark Fluid TSE (0.36 x 0.36 x 3 mm^3, TA 3:18 min), 3D SWI (0.16 x 0.16 x 1.2 mm^3, TA 5:15 min) and 3D SWI minIP. Iron deposition and central vein of MS lesions are clearly visible in the SWI image.

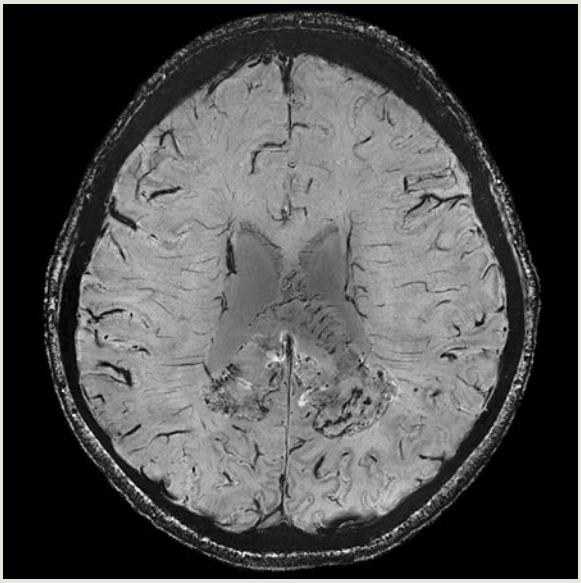
MedUni Wien, Vienna, Austria



Dual Mode unlocks system flexibility: In less than 10 minutes, you can switch MAGNETOM Terra's[7] software and hardware between clinical and research modes. This unique feature gives you the flexibility you need to perform key tasks.



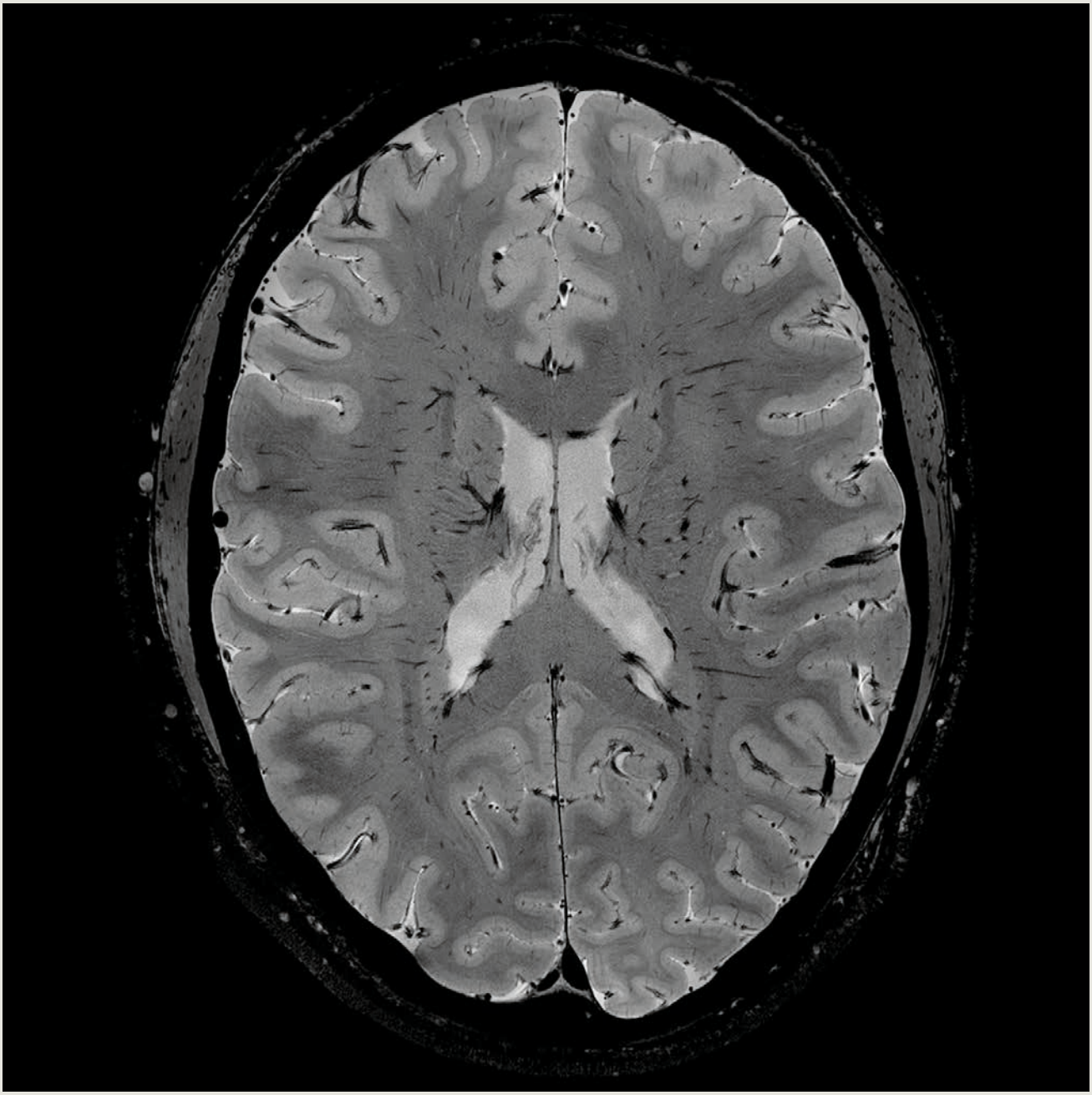
3 Tesla: 0.85 x 0.72 x 2 mm^3



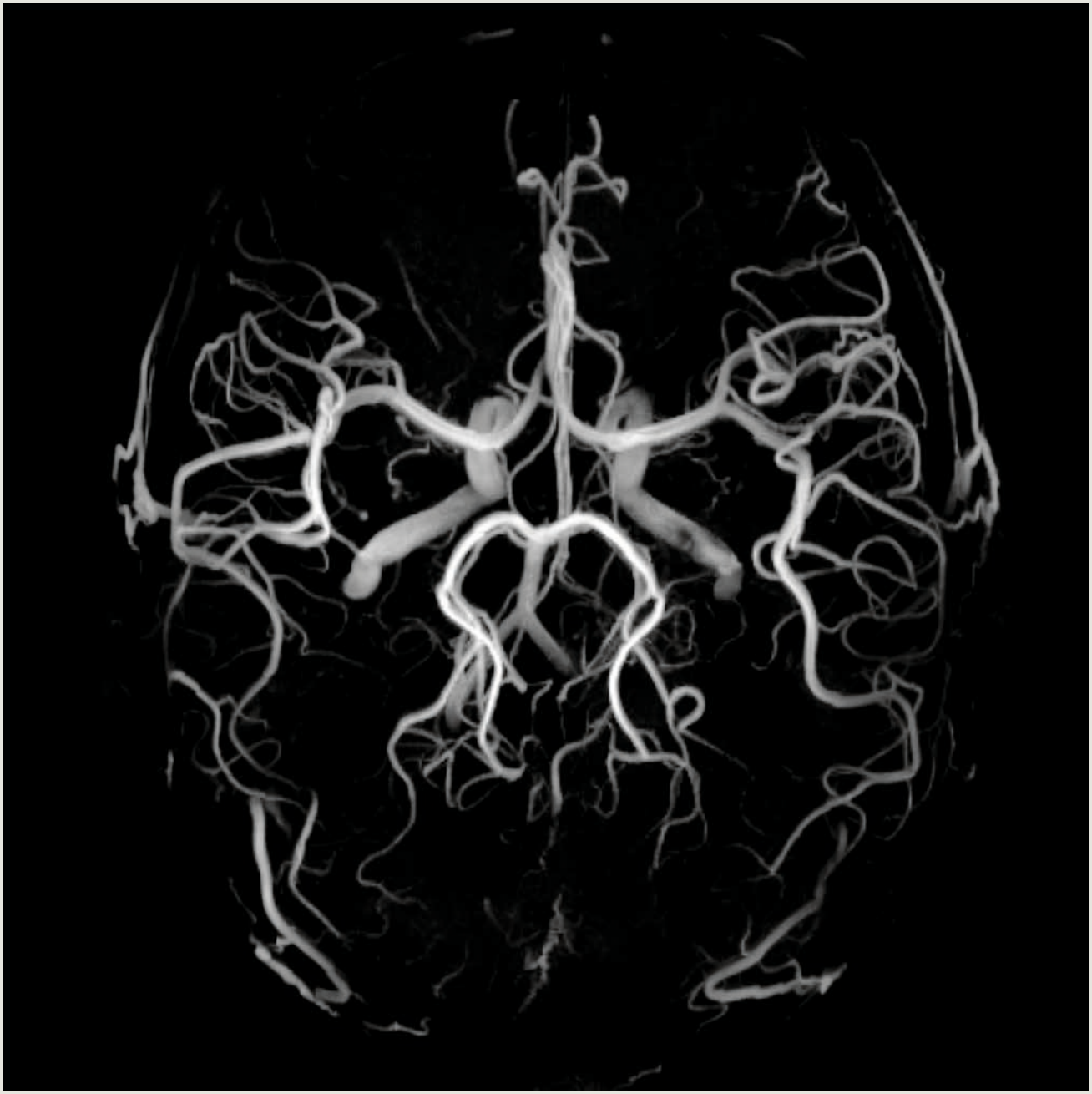
7 Tesla: 0.25 x 0.25 x 1 mm^3

3D SWI of Glioblastoma: 3D SWI minIP provides superior assessment of the microvasculature.

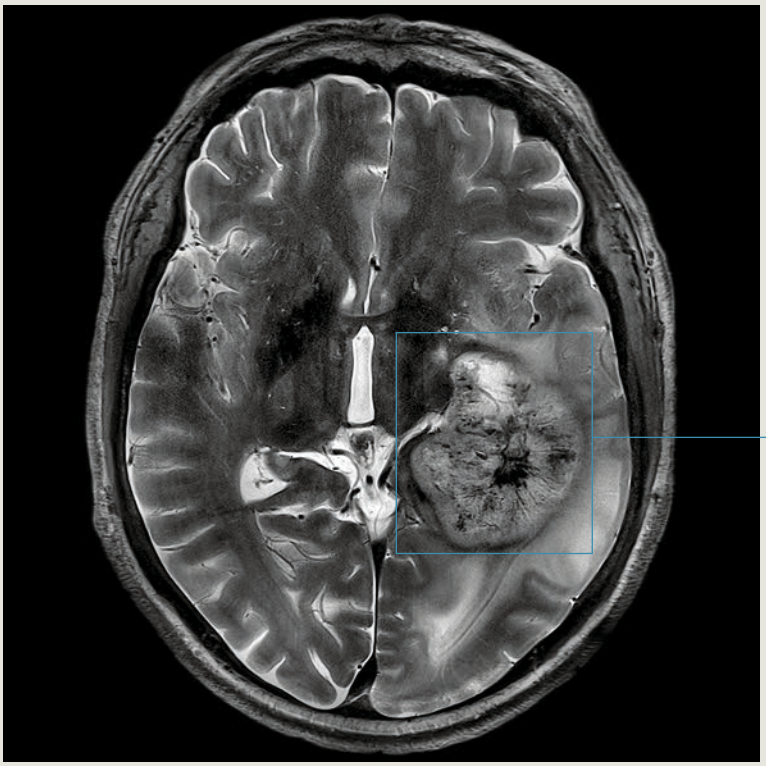
Erwin L. Hahn Institute for MRI, Essen, Germany



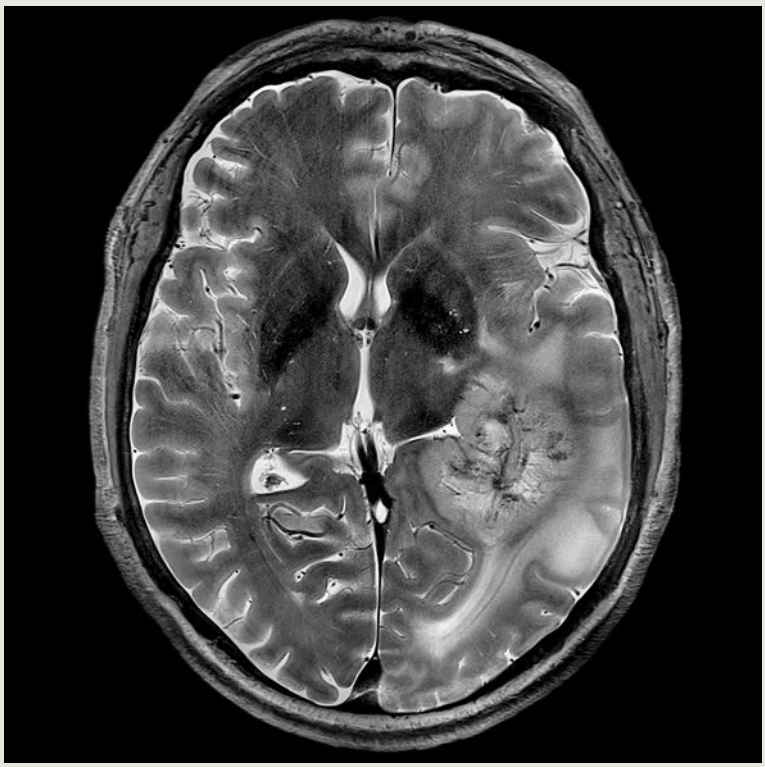
Ultra-fine anatomical details: T2* contrast at ultra-high resolution of 0.17 x 0.17 x 0.8 mm^3.
Leibniz Institute for Neurobiology (LIN), OvGU, Magdeburg, Germany

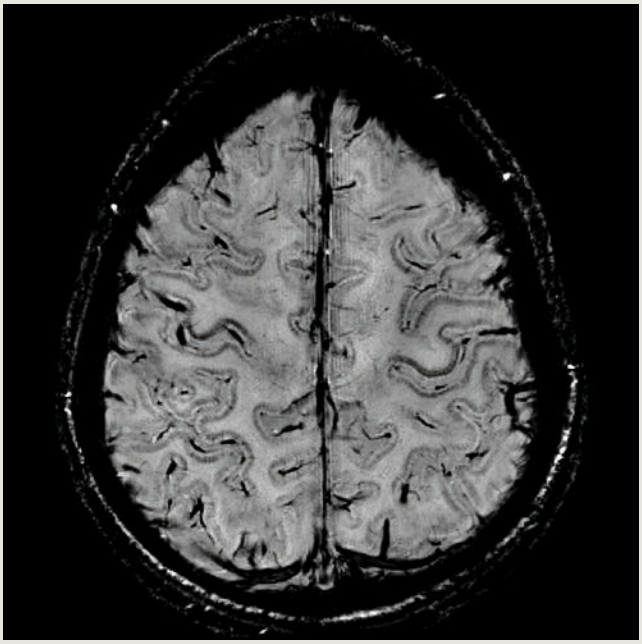


ToF angiography: Whole brain, with 0.5 mm isotropic resolution with venous saturation pulses enabled. VERSE technique used for SAR reduction.
CMRR, Minnesota, USA

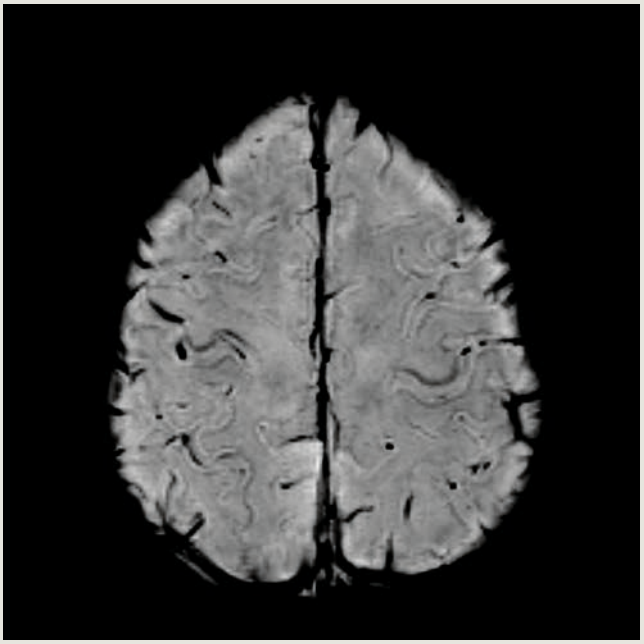


Glioblastoma: Higher SNR for ultra-high 0.2 mm in-plane resolution for imaging within tumor vascularization.
DKFZ, Heidelberg, Germany





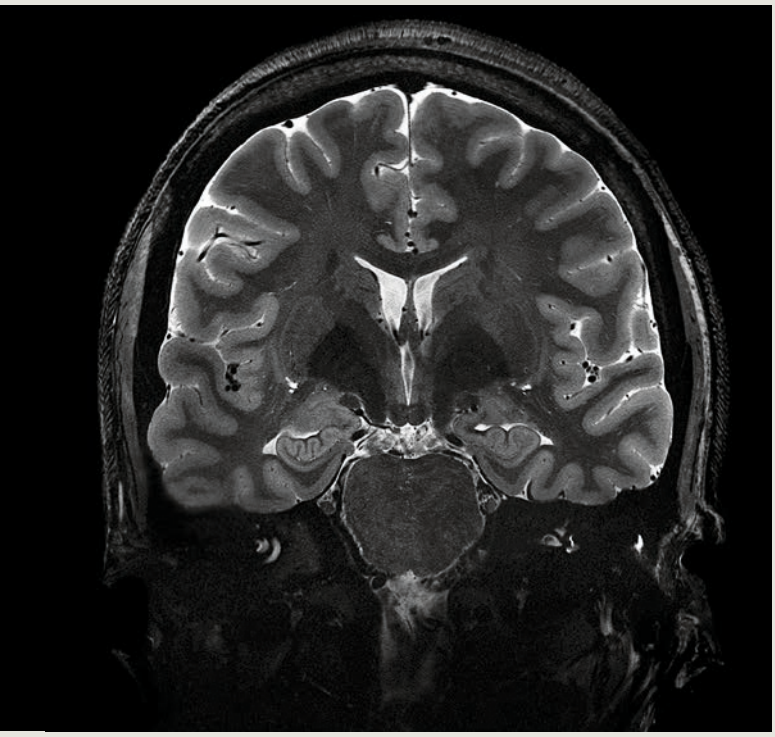
7 Tesla: 0.5 x 0.5 x 0.8 mm³

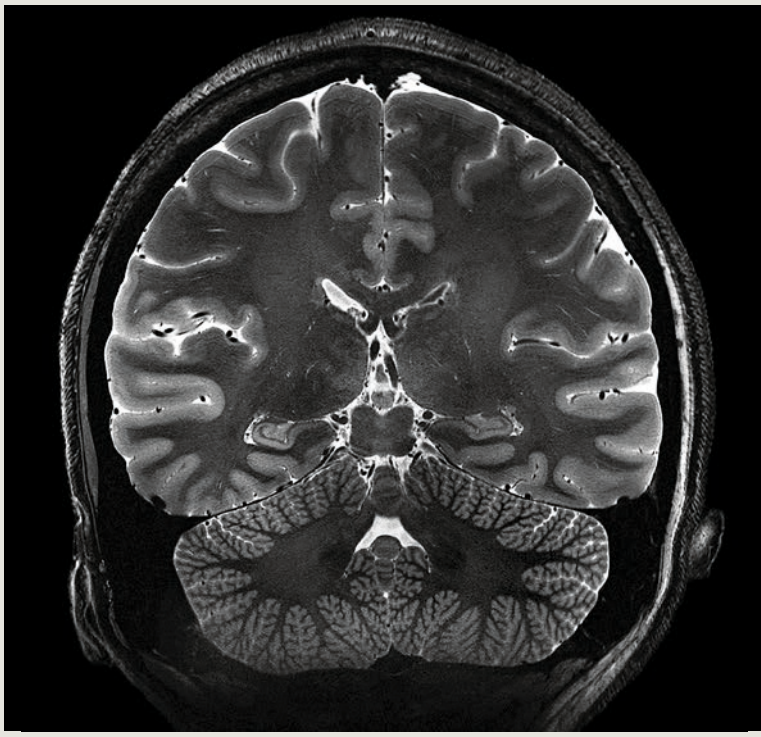


3 Tesla: 0.8 x 0.8 x 2.5 mm³

Amyotrophic Lateral Sclerosis (ALS):
Abnormally increased dephasing is characteristic of ALS in the motor regions, and is more clearly delineated in 3D SWI images at 7T than at 3T.

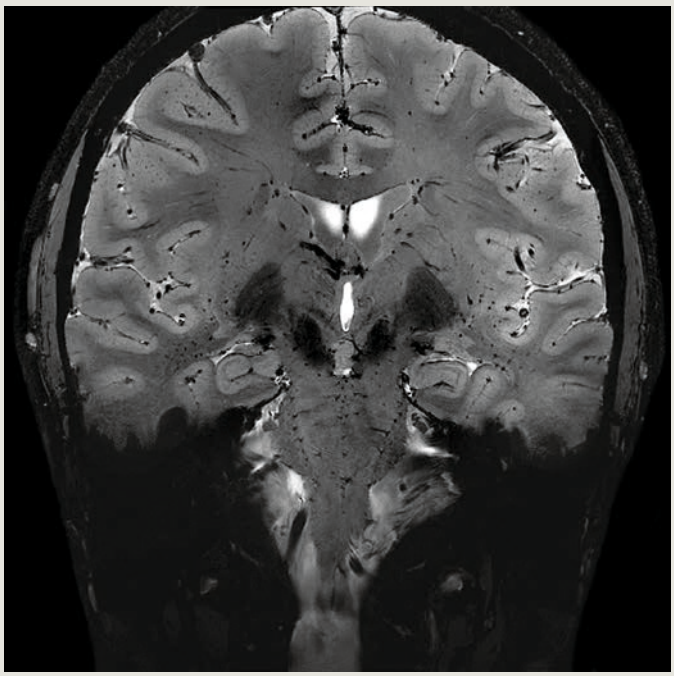
CCF, Cleveland, USA

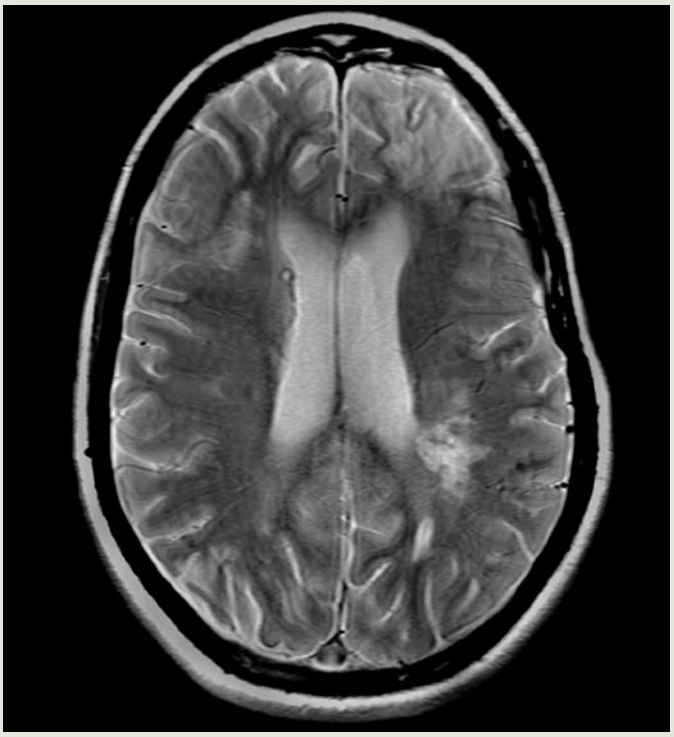




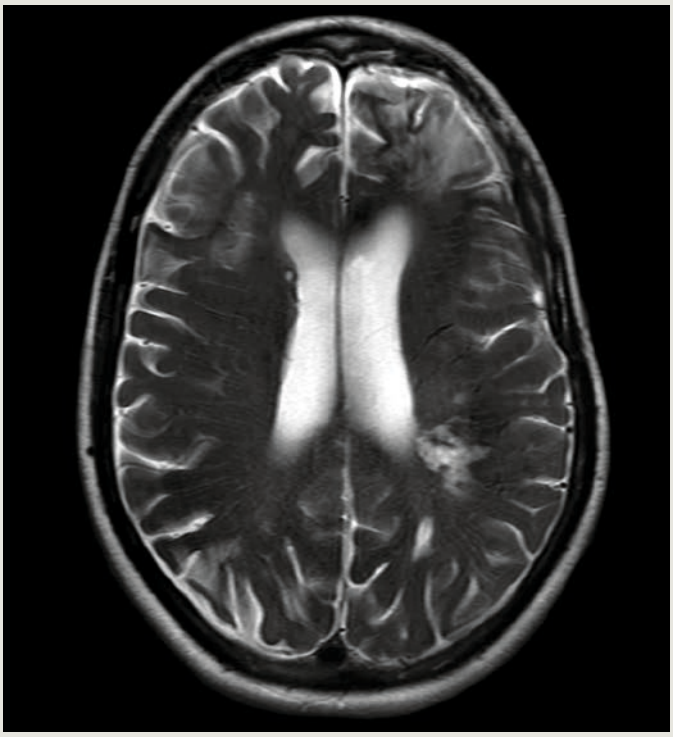
Hippocampus imaging: High-resolution imaging of the hippocampus at 0.25 mm in-plane resolution.
Scannexus, Maastricht, Netherlands

T2* weighted imaging: High-resolution imaging of the brainstem at 0.3 mm in-plane resolution. MGH, Boston, USA

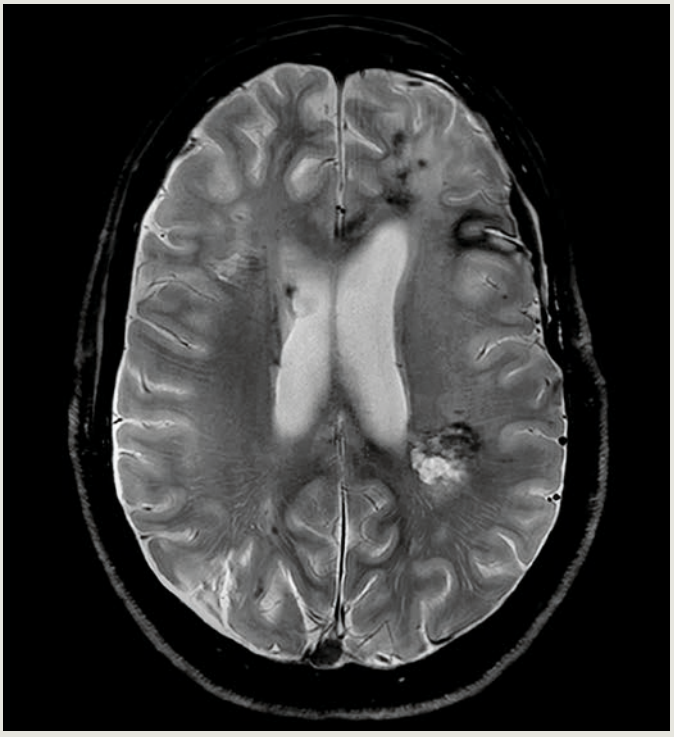




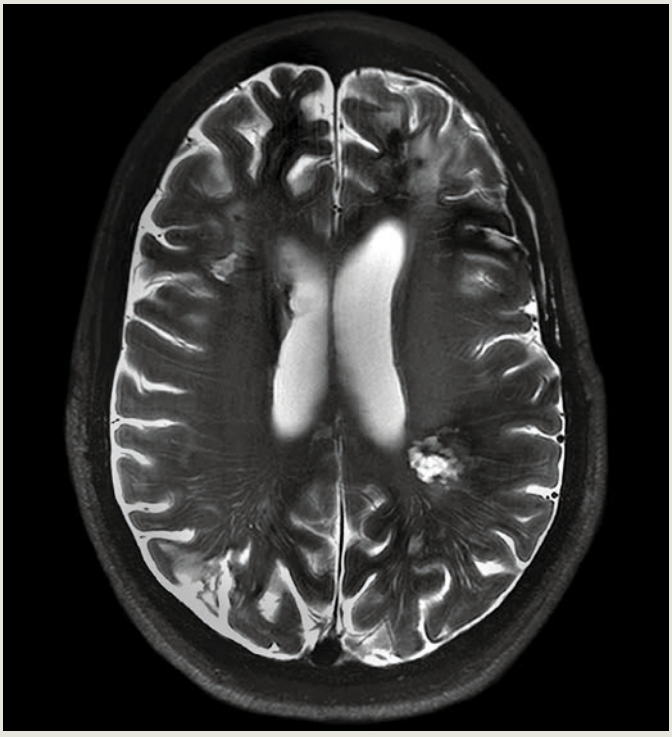
3 Tesla: PD TSE, 0.7 x 0.4 x 5 mm³, TA 2:38 min



3 Tesla: T2 TSE, 0.7 x 0.4 x 5 mm³, TA 2:38 min



7 Tesla: PD TSE, 0.2 x 0.5 x 3 mm³ , TA 3:09 min



7 Tesla: T2 TSE, 0.2 x 0.5 x 3 mm³ , TA 3:09 min

Diffuse axonal injury: The higher sensitivity at 7T reveals hemosiderin from traumatic brain injury in PD images.

Erwin L. Hahn Institute for MRI, Essen, Germany

Microscopic imaging for MSK:
High resolution anatomical details in
PD TSE with FatSat in the acquisition.
MedUni Wien, Vienna, Germany

Microscopic imaging for MSK:
Complete rupture of the cruciate ligament (top) and vertical tear of the meniscus (bottom) visible in PD TSE with FatSat (0.19 x 0.37 x 2.5 mm^3, TA 4:08 min).

MedUni Wien, Vienna, Germany

Join the largest research community

Your reputation plays a pivotal role in your institution's success. MAGNETOM Terra[7] has the power to let you go deeper than ever before, making your research and patient outcomes stand out from the rest. What's more, this leading-edge technology can help you attract the brightest minds to your facility, further enhancing your capabilities. MAGNETOM Terra[7] has the potential to put your organization firmly on the map, offering access to an exclusive network of expertise and broad scope for collaboration and exchange.

Join the largest research community

with over 65% of all UHF users

Over 65%
of 7T scanners deployed worldwide are from Siemens

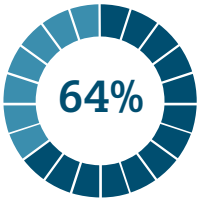
Strong network
for collaboration and peer-to-peer exchange

Attract and retain the brightest minds, and publish first

Enhance your reputation
MAGNETOM Terra[7] helps you achieve your research goals, giving you the opportunity to publish first and become a true opinion leader. This advanced technology has the potential to strengthen your position by attracting the brightest brains to your facility. The scanner lets you deliver previously unseen insights that could improve patient outcomes and further enhance your reputation.

> "When we were in a position to order a 7T system, Siemens was the logical choice."[4]

Professor Peter Jezzard,
Professor of Neuroimaging,
University of Oxford, Oxford, UK



64% of ISMRM abstracts in 2014 were based on data from Siemens UHF systems.[2]

Expand your network

Even if you are taking your first steps in ultra-high-field imaging, you will never be alone. Siemens has proven expertise in UHF MRI and cultivates links with an extensive network of users. As a result, you benefit from the experience of others and can share your own ideas. Siemens is the global leader in 7T – with a market share of over 65% and more than 25 years of experience in this field.

Exchange your ideas with peers

When you become part of the Siemens UHF community, you join an exclusive group of outstanding MRI experts. Through collaboration and exchange with other leaders in your field, you can extend your own knowledge and gain deeper insights. Siemens' regular user meetings and an online discussion board are the ideal platforms to interact with your peers.

100% of vendor-integrated human MRI scanners with a field strength higher than 7T are from Siemens

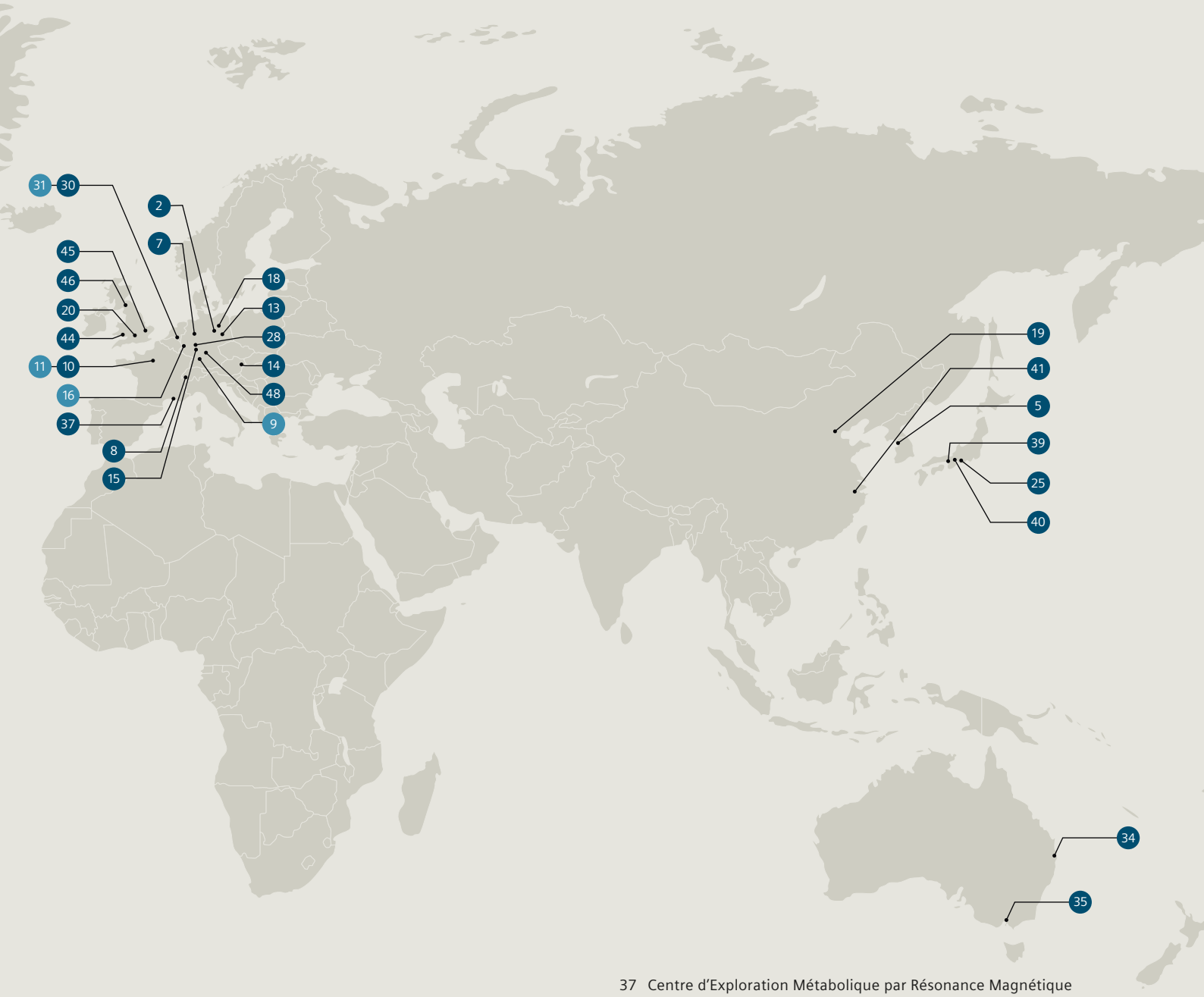
Over 65% of 7T scanners deployed worldwide are from Siemens

7T MRI scanners

9.4T, 10.5T and 11.7T MRI scanners

UHF systems installed and projects in progress

1 Athinoula A. Martinos Center for Biomedical Imaging of MGH and MIT, Boston, Massachusetts, USA
2 Leibniz Institute for Neurobiology (LIN), Magdeburg, Germany
3 Bernard and Irene Schwartz Center for Biomedical Imaging (CBI) of New York University Langone Medical Center, New York City, New York, USA
4 Center for MR Research (CMRR), University of Minnesota, Minneapolis, Minnesota, USA
5 Neuroscience Research Institute (NRI) of Gachon University of Medicine and Science, Incheon, South Korea
6 Advanced Imaging Research Center (AIRC), Oregon Health & Science University, Portland, Oregon, USA
7 Erwin L. Hahn Institute for Magnetic Resonance Imaging (ELH), Essen, Germany
8 Center for Imaging in Biomedicine (CIBM), École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland
9 Max Planck Institute for Biological Cybernetics (MPI KYB), Tübingen, Germany (9.4T)
10 NeuroSpin, French Alternative Energies and Atomic Energy Commission (CEA), Saclay, France
11 NeuroSpin, French Alternative Energies and Atomic Energy Commission (CEA), Saclay, France (11.7T)
12 Magnetic Resonance Research Center (MRRC), University of Pittsburgh Medical Center (UPMC), Pittsburgh, Pennsylvania, USA
13 Max Planck Institute for Human Cognitive and Brain Sciences (MPI), Leipzig, Germany
14 Excellence Center for Highfield MR, Medical University of Vienna (MUW), Vienna, Austria
15 German Cancer Research Center (DKFZ), Heidelberg, Germany
16 Institute of Neuroscience and Medicine (INM), Research Centre Jülich, Jülich, Germany (9.4T)
17 Center For Magnetic Resonance And Optical Imaging (MMRRCC), University of Pennsylvania Health System (HUP), Philadelphia, Pennsylvania, USA
18 Berlin Ultrahigh Field Facility (B.U.F.F.), Experimental and Clinical Research Center (ECRC), Berlin, Germany
19 State Key Laboratory of Brain and Cognitive Science, Institute of Biophysics, Chinese Academy of Sciences (CAS), Beijing, China
20 Oxford Centre for Functional MRI of the Brain (FMRIB), University of Oxford, Oxford, UK
21 Magnetic Resonance Imaging Research Center, Auburn University, Auburn, Alabama, USA
22 Center for MR Research (CMRR), University of Minnesota, Minnesota, Minneapolis, USA
23 Functional MRI Facility (FMRIF), National Institute of Mental Health and Neurological Disorders and Stroke, National Institutes of Health (NIH-NIMH & NINDS), Bethesda, Maryland, USA
24 National Institute of Neurological Disorders and Stroke, National Institutes of Health (NIH-NINDS), Bethesda, Maryland, USA (11.7T)
25 National Institute of Information and Communication Technology (NiCT) / Center for Information and Neural Networks (CiNET), Osaka, Japan



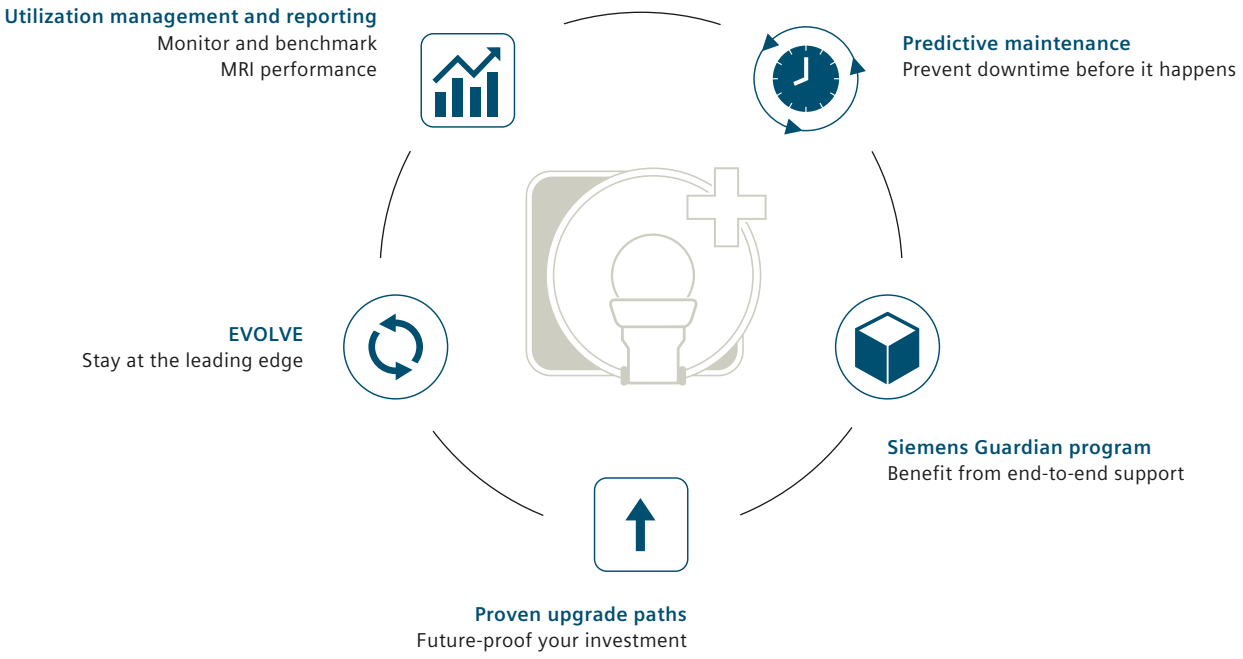
26 Center for MR Research (CMRR), University of Minnesota, Minnesota, Minneapolis, USA (10.5T)
27 Center for Imaging of Neurodegenerative Diseases (CIND), San Francisco VA Medical Center, UCSF, San Francisco, California, USA
28 German Center for Neurodegenerative Diseases (DZNE), Bonn, Germany
29 Biomedical Research Imaging Center (BRIC), University of North Carolina (UNC), Chapel Hill, North Carolina, USA
30 Maastricht Brain Imaging Centre (M-BIC), Maastricht University, Maastricht, The Netherlands
31 Maastricht Brain Imaging Centre (M-BIC), Maastricht University, Maastricht, The Netherlands (9.4T)
32 Mt Sinai School of Medicine, New York City, New York, USA
33 Cleveland Clinic, Cleveland, Ohio, USA
34 Centre for Advanced Imaging, University of Queensland, Brisbane, Queensland, Australia
35 Royal Melbourne Hospital, University of Melbourne, Victoria, Australia
36 University of Sao Paulo (USP), Sao Paulo, Brazil
37 Centre d'Exploration Métabolique par Résonance Magnétique (CEMEREM), Marseille, France
38 Centre for Functional and Metabolic Mapping, Robarts Research Institute, London, Ontario, Canada
39 National Institute for Physiological Sciences (NIPS), Okazaki, Japan
40 Kyoto University, Kyoto, Japan
41 Zhejiang University, Hangzhou, China
42 Brigham and Women's Hospital (BWH), Boston, USA
43 University of Southern California (USC), Los Angeles, California, USA
44 Cardiff University Brain Research Imaging Centre (CUBRIC) Cardiff, UK
45 Wolfson Brain Imaging Centre (WBIC), University of Cambridge, Cambridge, UK
46 Imaging Centre of Excellence (ICE), South Glasgow University Hospital, Glasgow, UK
47 Magnetic Resonance Research Center (MRRC), Yale University, New Haven, Connecticut, USA
48 Comprehensive Heart Failure Center (CHFC), Würzburg University Hospital, Würzburg, Germany

Service and exchange

Siemens' end-to-end services ensure you stay at the leading edge of MRI technology throughout the entire system lifecycle – from installation, to operation, to upgrades, to ongoing support. Moreover, our diverse communication platforms and communities keep you up to speed on the world of MRI and enable you to share your ideas and experiences with your peers.

Service and exchange

Comprehensive services



Utilization management and reporting
This powerful solution gives you more from your MRI scanner. It allows you to monitor KPIs and benchmark your system against other Siemens MRI machines at any facility or organization. So you can keep track of your MRI performance, and reap the maximum reward from your scanner.

Predictive maintenance
When systems go down, it impacts both your ability to care for your patients and your bottom line. Siemens provides a predictive maintenance service to help you minimize lost time. It informs you when a part of your MRI system is likely to fail, enabling you to plan repairs and prevent downtime before it happens.

EVOLVE: Keep your hardware and software up to date at all times – a key factor in enhancing performance and diagnostic quality. You receive all applicable upgrades for software and the *syngo* OS, plus at least one workstation hardware upgrade within the first six years.

Siemens Guardian program

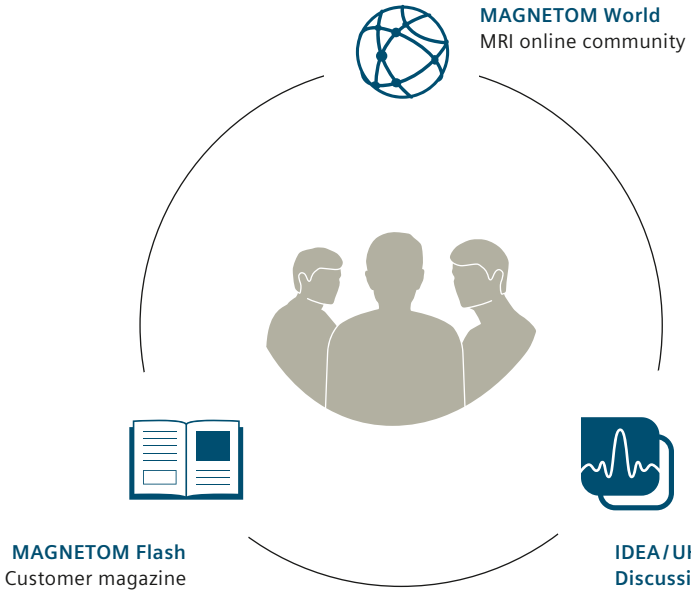
This program provides the latest service technology so you can better manage your MRI system. It combines many features in a single package – offering real-time system monitoring, expert advice to improve workflow efficiency, proactive maintenance, and support. Moreover, it guarantees defined repair times, giving you complete peace of mind.

Proven upgrade paths

With MAGNETOM scanners, taking your MRI system to the next level is simplicity itself, thanks to clearly defined upgrade paths. In fact, Siemens has built an entire organization (CDV) to help customers truly maximize their system life – and increase their return on investment.

Service and exchange

Peer-to-peer information



MAGNETOM World
Siemens' global MRI community offers peer-to-peer support and information. Radiologists, cardiologists, technologists, and physicists have all contributed with publications, presentations, training documents, case studies, and more – all freely available to you via this unique network. Plus, the bi-annual MAGNETOM World Summit is the ideal opportunity to share and exchange ideas.

MAGNETOM Flash
Published quarterly, the MR customer magazine features up-to-date clinical case studies, application tips and technical and product information relevant to you. All content is carefully compiled by experts to meet the needs of today's MRI users in both clinical and research scenarios. In fact, 98.5% of readers report that MAGNETOM Flash is clinically relevant.

Visit MAGNETOM World

www.siemens.com/magnetom-world

On MAGNETOM Flash: "An excellent and useful combination of technological and clinical articles that both keep one up to date with advances in MRI and provide practical assistance for day-to-day practice – good and interesting learning material."[4]

Mark Lourensz, St Vincent's Hospital
Fitzroy, Victoria, Australia

IDEA / UHF Online Discussion Board

IDEA[7] is an open development platform for the largest and most active 3T and UHF research communities in the world. It unites users from across the globe and fosters innovation in the field of MRI. Members collaborate online at www.mr-idea.com and at an annual meeting. IDEA includes an exclusive area, the UHF Online Discussion Board, to help users focus on topics of interest, as well as find and communicate with the right peers.

MAGNETOM Terra[7]
Technical specifications

Field strength	7 Tesla
Bore size	60 cm
Magnet length	270 cm
System length*	297 cm
System weight (in operation)*	< 25 tons
Minimum room size*	50 m^2 / (w/o pTX and 3rd order shim option)
RF transmit	TimTX-1, TimTX-8
RF receive	Tim [32 x 32] [64 x 64]
Gradient strength	XR gradients (80 mT/m @ 200 T/m/s)
Helium consumption	Zero Helium boil-off technology
Quiet Suite/DotGO	Available in research mode
Local coils in clinical mode	1TX/32RX head coil, 1TX/28RX knee coil

* Minimum total space requirement for magnet, electronics, and console room

siemens.com/terra

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Please find fitting accessories:
www.siemens.com/medical-accessories

All MR images shown in this brochure are from 7T scanners without CE or 510k approval.

[1] Scheenen et al., Magn Reson Mater Phy (2008) 21:95–101

[2] S. Trattnig, et al. Clinical applications at ultrahigh field (7 T). Where does it make the difference? NMR Biomed. 2015.

[3] Data on file.

[4] The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

[5] Rendered with a Siemens internal cinematic rendering prototype.

[6] Compared to previous generations of MAGNETOM 7T

[7] MAGNETOM Terra is still under development and not commercially available in the U.S. and other countries yet. Its future availability cannot be ensured. Some features of MAGNETOM Terra will remain ongoing research.

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