



## Marios Georgiadis

Instructor, Radiology

### Bio

---

#### BIO

Marios is an Instructor of Neuroimaging, part of the Faculty of the Stanford University School of Medicine.

He is in the Translational Neuroimaging lab, headed by Dr Michael Zeineh, since 2019.

His research focuses mainly on myelin and iron imaging in neurologic diseases, primarily using experimental X-ray and MRI approaches. He is also actively involved in projects related to imaging and modeling brain trauma, exosome signatures of neurodegeneration, and imaging the brain using advanced forms of electron and light microscopy.

Marios is a mechanical engineer by training (School of Mechanical Engineering, National Technical University of Athens, Greece). His thesis "Closed-loop force control of a haptic surgical simulator", was performed in the Control Systems Lab of Prof. Evangelos Papadopoulos.

In 2011 he obtained his MSc in Biomedical Engineering from ETH Zurich (Swiss Federal Institute of Technology). He performed his thesis in IBM Research on "Advanced pathology using the Microfluidic Probe", under Emmanuel Delamarque and Govind Kaigala, and was awarded the ETH medal for this work.

He completed his PhD in Bone Biomechanics in the lab of Prof. Ralph Muller in ETH Zurich, where he developed X-ray scattering-based methods to investigate bone microstructure in 3D, research that earned him the 2nd Student Award from the European Society for Biomechanics in 2015.

In 2016 he started using imaging methods to study brain microstructure, in the lab of Prof. Markus Rudin, in the Institute for Biomedical Engineering of ETH Zurich. There, he combined X-ray scattering with DTI, histology and CLARITY for studying rodent brain.

In 2017 he joined the MRI Biophysics group of Profs. Els Fieremans and Dmitry Novikov in New York University School of Medicine, to study human and mouse brain microstructure using X-ray scattering and diffusion MRI.

His research on myelin in mouse and human brain using X-ray scattering has been supported twice by the Swiss National Science Foundation.

#### ACADEMIC APPOINTMENTS

- Instructor, Radiology

## Teaching

---

### COURSES

2023-24

- The Magic of Medical Imaging: RAD 21Q (Aut)

## Publications

---

### PUBLICATIONS

- **Longitudinal alterations of cerebral blood flow in high-contact sports.** *Annals of neurology*  
Karimpoor, M., Georgiadis, M., Zhao, M. Y., Goubran, M., Moein Taghavi, H., Mills, B. D., Tran, D., Mouchawar, N., Sami, S., Wintermark, M., Grant, G., Camarillo, D. B., Moseley, et al  
2023
- **Using light and X-ray scattering to untangle complex neuronal orientations and validate diffusion MRI.** *eLife*  
Menzel, M., GraSSel, D., Rajkovic, I., Zeineh, M. M., Georgiadis, M.  
2023; 12
- **Imaging crossing fibers in mouse, pig, monkey, and human brain using small-angle X-ray scattering.** *Acta biomaterialia*  
Georgiadis, M., Menzel, M., Reuter, J. A., Born, D., Kovacevich, S., Alvarez, D., Taghavi, H. M., Schroeter, A., Rudin, M., Gao, Z., Guizar-Sicairos, M., Weiss, T. M., Axer, et al  
2023
- **SAXS imaging reveals optimized osseointegration properties of bioengineered oriented 3D-PLGA/aCaP scaffolds in a critical size bone defect model.** *Biomaterials*  
Casanova, E. A., Rodriguez-Palomo, A., Stahli, L., Arnke, K., Groninger, O., Generali, M., Neldner, Y., Tiziani, S., Dominguez, A. P., Guizar-Sicairos, M., Gao, Z., Appel, C., Nielsen, et al  
2023; 294: 121989
- **Scanning The Brain Using X-Ray Scattering**  
Georgiadis, M.  
INT UNION CRYSTALLOGRAPHY.2022: A37
- **Iron and Alzheimer's Disease: From Pathology to Imaging.** *Frontiers in human neuroscience*  
Tran, D., DiGiacomo, P., Born, D. E., Georgiadis, M., Zeineh, M.  
2022; 16: 838692
- **The Presence of the Temporal Horn Exacerbates the Vulnerability of Hippocampus During Head Impacts.** *Frontiers in bioengineering and biotechnology*  
Zhou, Z., Li, X., Domel, A. G., Dennis, E. L., Georgiadis, M., Liu, Y., Raymond, S. J., Grant, G., Kleiven, S., Camarillo, D., Zeineh, M.  
2022; 10: 754344
- **Towards a comprehensive delineation of white matter tract-related deformation.** *Journal of neurotrauma*  
Zhou, Z., Li, X., Liu, Y., Fahlstedt, M., Georgiadis, M., Zhan, X., Raymond, S. J., Grant, G., Kleiven, S., Camarillo, D. B., Zeineh, M.  
2021
- **Neuroradiologic Evaluation of MRI in High-Contact Sports.** *Frontiers in neurology*  
McAllister, D., Akers, C., Boldt, B., Mitchell, L. A., Tranvinh, E., Douglas, D., Goubran, M., Rosenberg, J., Georgiadis, M., Karimpoor, M., DiGiacomo, P., Mouchawar, N., Grant, et al  
2021; 12: 701948
- **Nanostructure-specific X-ray tomography reveals myelin levels, integrity and axon orientations in mouse and human nervous tissue.** *Nature communications*  
Georgiadis, M., Schroeter, A., Gao, Z., Guizar-Sicairos, M., Liebi, M., Leuze, C., McNab, J. A., Balolia, A., Veraart, J., Ades-Aron, B., Kim, S., Shepherd, T., Lee, et al  
2021; 12 (1): 2941
- **Validation study of small-angle X-ray scattering tensor tomography** *JOURNAL OF SYNCHROTRON RADIATION*  
Guizar-Sicairos, M., Georgiadis, M., Liebi, M.

2020; 27: 779–87

- **Retrieving neuronal orientations using 3D scanning SAXS and comparison with diffusion MRI.** *NeuroImage*  
Georgiadis, M., Schroeter, A., Gao, Z., Guizar-Sicairos, M., Novikov, D., Fieremans, E., Rudin, M.  
2019; 116214
- **High-speed tensor tomography: iterative reconstruction tensor tomography (IRTT) algorithm** *ACTA CRYSTALLOGRAPHICA A-FOUNDATION AND ADVANCES*  
Gao, Z., Guizar-Sicairos, M., Lutz-Bueno, V., Schroeter, A., Liebi, M., Rudin, M., Georgiadis, M.  
2019; 75: 223–38
- **Small-angle X-ray scattering tensor tomography: model of the three-dimensional reciprocal-space map, reconstruction algorithm and angular sampling requirements** *ACTA CRYSTALLOGRAPHICA A-FOUNDATION AND ADVANCES*  
Liebi, M., Georgiadis, M., Kohlbrecher, J., Holler, M., Raabe, J., Usov, I., Menzel, A., Schneider, P., Bunk, O., Guizar-Sicairos, M.  
2018; 74: 12–24
- **Ultrastructure Organization of Human Trabeculae Assessed by 3D sSAXS and Relation to Bone Microarchitecture** *PLOS ONE*  
Georgiadis, M., Guizar-Sicairos, M., Gschwend, O., Hangartner, P., Bunk, O., Mueller, R., Schneider, P.  
2016; 11 (8): e0159838
- **Techniques to assess bone ultrastructure organization: orientation and arrangement of mineralized collagen fibrils** *JOURNAL OF THE ROYAL SOCIETY INTERFACE*  
Georgiadis, M., Mueller, R., Schneider, P.  
2016; 13 (119)
- **Nanostructure surveys of macroscopic specimens by small-angle scattering tensor tomography** *NATURE*  
Liebi, M., Georgiadis, M., Menzel, A., Schneider, P., Kohlbrecher, J., Bunk, O., Guizar-Sicairos, M.  
2015; 527 (7578): 349+
- **3D scanning SAXS: A novel method for the assessment of bone ultrastructure orientation** *BONE*  
Georgiadis, M., Guizar-Sicairos, M., Zwahlen, A., Trussel, A. J., Bunk, O., Muller, R., Schneider, P.  
2015; 71: 42–52
- **Advanced glycation end-products diminish tendon collagen fiber sliding** *MATRIX BIOLOGY*  
Li, Y., Fessel, G., Georgiadis, M., Snedeker, J. G.  
2013; 32 (3-4): 169–77
- **Micro-immunohistochemistry using a microfluidic probe** *LAB ON A CHIP*  
Lovchik, R. D., Kaigala, G. V., Georgiadis, M., Delamarche, E.  
2012; 12 (6): 1040–43