

Society for Magnetic Resonance Angiography  
[www.society4mra.org](http://www.society4mra.org)

n° 31



Pre-conference Educational workshop  
August 27<sup>th</sup>

31<sup>st</sup> Annual Conference

Hosts: Jean-Michel Serfaty and Philippe Douek

President: Michael Markl

# Program at a Glance

## Pre-conference Educational Workshop

### Tuesday, August 27th (Registration at 07:30)

- 08:30 Welcome, and Announcements
- 08:40 Opening Remarks
- 08:45 Workshop 1: The Basics I – MR Techniques for Vessel Imaging
- 10:30 Coffee Break
- 11:00 Workshop 2: The Basics II – MR Techniques for Vessel Imaging
- 12:40 Lunch
- 13:30 Workshop 3: Clinical Applications I
- 15:20 Coffee Break
- 15:40 Session 4: Clinical Applications II
- 17:20 Closing Remarks
- 19:00 Welcome Reception: Brasserie St. Felix

## Main Conference Scientific Sessions and Poster Exhibition

### Wednesday, August 28th (Registration at 07:30)

- 08:30 Welcome, Introduction, Announcements, and Opening Remarks
- 08:45 Plenary Talk I
- 09:15 Session I: Emerging Techniques in MRA / 4D flow / AI
- 10:45 Coffee Break ( 10:45 to 11:15 )
- 11:15 Session II: Emerging Techniques in MRA / 4D flow / AI
- 12:45 Lunch ( 12:45 to 13:45 )
- 13:45 Session III: Abdominal MRA and Peripheral
- 14:30 Point and Counterpoint
- 15:00 Coffee Break ( 15:00 to 15:30 )
- 15:30 Session IV: Abdominal and Peripheral MRA
- 20:00 Evening Event: Les Machines de l'île

### Thursday, August 29th (Registration at 07:30)

- 08:30 Welcome, Introduction, Announcements, and Opening Remarks
- 08:45 Plenary Talk II
- 09:15 Session V: Cardiac MRA
- 10:40 Coffee Break ( 10:40 to 11:10 )
- 11:10 Session VI: Coronary MRA
- 12:50 Lunch and Poster Viewing ( 12:50 to 13:45 )
- 13:45 Session VII: Vessel Wall MRI
- 14:30 Point and Counterpoint
- 15:00 Coffee Break ( 15:00 to 15:30 )
- 15:30 Session VIII: Vessel Wall MRI
- 18:00 Evening Event: Château de la Poterie

### Friday, August 30th (Registration at 07:30)

- 08:30 Welcome, Introduction, Announcements, and Opening Remarks
- 08:45 Plenary Talk III
- 09:15 Session IX: 4D-FLOW MRA in the Aorta
- 10:20 Coffee Break ( 10:20 to 10:55 )
- 10:55 Session X: 4D-FLOW MRA in the Aorta
- 12:01 Point and Counterpoint
- 12:40 Lunch and Poster Viewing ( 12:40 to 13:45 )
- 13:45 Session XI: Contrast MRA
- 14:45 Point and Counterpoint
- 15:15 Coffee Break ( 15:15 to 15: 45 )
- 15:45 Session XII: Head and Neck MRA
- 16:40 Closing Session: Awards, Thank You, 2020 SMRA Conference

# Welcome

Welcome to Nantes and to the 31st Annual Meeting of the Society for Magnetic Resonance Angiography (SRMA). Over more than 30 years, the SMRA has grown to the pre-eminent annual meeting to discuss advances in the field of MRA. The scientific sessions have become the gathering of scientists, clinicians, corporate partners, trainees and others who are interested in MRA. Many innovations in this field were first presented and discussed at one of our meetings and these advances are now impacting diagnostic imaging and clinical care worldwide.

I would like to extend a special welcome to those who are attending their first meeting. I would wholeheartedly encourage you to participate fully in the discussion that occurs during the scientific sessions, lunches and breaks, and that often continue into the evening social events. Engaging with our corporate partners and exhibitors is always another highlight.

We will meet at La Cité des Congrès de Nantes, the city of Jules Verne. Verne was born on 8 February 1828, on a small artificial island on the Loire River within the town of Nantes. Verne's collaboration with the publisher Pierre-Jules Hetzel led to the creation of the *Voyages extraordinaires*, a widely popular series of scrupulously researched adventure novels including *Journey to the Center of the Earth* (1864), *Twenty Thousand Leagues Under the Sea* (1870), and *Around the World in Eighty Days* (1873). I am sure that his adventurous spirit will serve as a stimulus for innovative imaging presentations and discussions at this year's SMRA meeting.

Jean-Michel Serfaty, Philippe Douek and their local team have done a fabulous job of developing an engaging scientific and social program. Jointly with the SMRA board, they have developed an outstanding pre-conference educational workshop as well as innovative 3-day scientific sessions. A number of new program elements will be featured this year, including an early career mentoring session, diversity session, point-counterpoint debates, breakout hands-on software sessions, and the inaugural 'Kazuhiko Sadamoto Lecture'. Our society secretariat also played an invaluable role keeping track of the many details, both big and small, associated with the meeting; a special thank you goes out to Kevin Henley, Johanne Langford and Janette Wallace.

The core of the meeting consists of oral and poster presentations given by many of you. As you will see in this program book, the pace and quality of innovation in our field remains high. Engaging early career scientist and trainees in our society has been critical to our success and I am pleased to see the number of talented young investigators who will be competing for the Potchen and Passariello Awards (best and poster presentations). In this context, we would like to acknowledge the considerable support provided by both the US National Institute of Health, as well as the Martin R Prince Charitable Foundation who together have helped fund the attendance of 30 early career scientists and trainees at the 2019 SMRA meeting.

Our corporate sponsors are essential to the continued success of this meeting. Through their generous support, they allow us to continue to develop and host the SMRA annual meeting in locations around the world. Please stop by their exhibits and thank them for their ongoing support. I send a sincere thank you to all of our sponsors.

I hope that you find our meeting to be a stimulating and enriching experience. During this year's meeting, I will pass the Presidential Gavel onto Giles Roditi. Giles has been invaluable in helping organize this year's meeting and is now working hard with Debiao Li and Paul Finn to arrange the 2020 SMRA meeting. I look forward to seeing you again at next year's meeting in Los Angeles, California.

Sincerely,

*Michael Markl, PhD*

President: Society of Magnetic Resonance Angiography

# Educational Workshop

**Tuesday, August 27<sup>th</sup> (Registration at 07:30)**

08:30 Welcome, and Announcements ( 08:30 - 08:40 )

08:40 Opening Remarks ( 08:40 - 08:45 )

## **Workshop 1: The Basics I — MR Techniques for Vessel Imaging**

Moderator: Charles Dumoulin

08:45 Introduction to MRA and K-space

Charles Dumoulin — University of Cincinnati

09:00 Imaging acceleration, compressed sensing

Monica Sigovan — University of Lyon

09:15 Phase Contrast: 2D, 3D and 4D Flow

Thekla Oechtering — Universitätsklinikum Schleswig - Holstein

09:35 Non-Contrast MRA Techniques: Basic to Advanced

Ioannis Koktzoglou — NorthShore University HealthSystem - Evanston

09:55 Contrast Enhanced MRA: 3D, Dynamic

Tim Leiner — Utrecht University Medical Center

10:10 How to Develop MRA in Clinical Practice

Jeremy Collins — Mayo Clinic - Rochester

10:25 Discussion

All Speakers

10:30 Coffee Break ( 10:30 – 11:00 )

## **Workshop 2: The Basics II — MR Techniques for Vessel Imaging**

Moderator: Claudia Pietro

11:00 What is Artificial Intelligence and Machine Learning?

Diana Mateus — University of Nantes

11:15 Artificial Intelligence and Machine Learning in MRA

Claudia Pietro — King's College - London

11:30 MRA Image Processing and Quantification

Nadija Kachenoura — French Institute of Health and Medical Research - Paris

11:50 Vessel Structure and Function: PWV, Compliance, Hemodynamics

Oliver Wieben — University of Wisconsin - Madison

12:10 Motion Adapted Cardiothoracic MRI/A + Coronary MRA

Matthias Stuber — University of Lausanne

12:30 Discussion

All speakers

12:40 Lunch ( 12:40 - 13:30 )



## Workshop 3: Clinical Applications I

Moderator: Chun Yuan

- 13:30 Neuro Intracranial (Anuerysms and AVMs)  
Kevin DeMarco — Walter Reed National Military Medical Center - Bethesda
- 13:45 Neuro Intra- and Extracranial (Atherosclerosis)  
John Huston — Mayo Clinic - Rochester
- 14:00 Vessel Wall Imaging — Head and Neck  
Chun Yuan — University of Washington - Seattle
- 14:15 Thoracic Aorta  
Alban Radheuil — French Institute of Health and Medical Research - Paris
- 14:30 Abdominal Aorta  
Jeremy Collins — Mayo Clinic - Rochester
- 14:45 Pulmonary MRA  
Christopher Francois — University of Wisconsin - Madison
- 15:00 Heart and Valves  
Jean-Francois Paul — Institut Mutualiste Montsouris - Paris
- 15:10 Discussion  
All speakers
- 15:20 Coffee Break ( 15:20 - 15:40 )

## Workshop 4: Clinical Applications II

Moderator: Elizabeth Hecht

- 15:40 Renovascular MRA  
Giles Roditi — University of Glasgow
- 15:55 Abdomen Extra-Renal  
Elizabeth Hecht — Columbia University - New York
- 16:10 Venous  
Francine Touveny — University of Nantes
- 16:25 Peripheral  
Peter Douglas — University of Glasgow
- 16:40 Pediatric Vessel Imaging  
Paul Finn — University of California - Los Angeles
- 16:55 Update on Contrast Agents  
Martin Prince — Weill Cornell Medicine - New York
- 17:10 Discussion  
All speakers
- 17:20 Closing Remarks
- 19:00 Welcome Reception: Brasserie St. Felix  
1 Rue Lefèvre Utile, 44000 Nantes

# Scientific Sessions

## Wednesday, August 28th (Registration at 07:30)

08:30 Welcome, Introduction, and Announcements

08:40 Opening Remarks

### 08:45 Plenary Talk I: AI - Impact on Clinicians, Patients Healthcare, Business Opportunities

**Nassir Navab** — Johns Hopkins University - Baltimore

### Session I: Emerging Techniques in MRA / 4D flow / AI

09:15 Introduction, and Moderation — Catherine Ludman, and Monica Sigovan

09:20 Highly Accelerated NCE-MRA Using k-space Subtraction with Phase and Intensity Correction (KSPIC): Improved Reconstruction Accuracy and Background Suppression

••• Hao Li — Department of Radiology, University of Cambridge

09:30 Fresh Blood Imaging (FBI) with Centric ky-kz Trajectory and Exponential Refocusing Flip Angle: Comparison with Standard FBI

Mitsue Miyazaki — University of California - San Diego - La Jolla

09:40 High Resolution Multi-echo Time-of-flight MRA for Imaging of Intra-Renal Vasculature at 7T

Catherine Ludman — Nottingham Nottingham University Hospitals NHS Trust

9:50 Acceleration Mapping in the Human Aorta at 7T

••• Simon Schmidt — German Cancer Research Center (DKFZ) - Heidelberg

10:00 Validation of Hemodynamic Analysis using High Spatial Resolution 3-dimensional Phase-Contrast Magnetic Resonance Imaging with 7-tesla MR Scanner

Haruo Isoda — Nagoya Brain and Mind Research Center, Nagoya University

10:10 Methemoglobinemia and T1 Contrast

Seong-Eun Kim — University of Utah - Salt Lake City

10:20 Initial Results of Reynolds Stress Tensor Quantification using Flow-MRF

••• Sebastian Flassbeck — German Cancer Research Center (DKFZ) - Heidelberg

10:30 Is it Possible to Improve Near-wall 4D-flow MRI Measurements with Deep Learning?

Vitaliy Rayz — Purdue University - West Lafayette

### Session I: Oral Posters

10:40 Ungated QISS MR Angiography of the Peripheral Arteries using a Golden Angle Readout and Temporal Maximum Intensity Projection

Ioannis Koktzoglou — NorthShore University HealthSystem - Evanston

10:42 High-resolution MR Angiography of the Peripheral and Carotid Arteries using Stack-of-stars QISS

Ioannis Koktzoglou — NorthShore University HealthSystem - Evanston

10:44 Accelerated 4D-flow MRI using Machine Learning (ML) Enabled Three Point Flow Encoding

••• Dahan Kim — University of Wisconsin - Wisconsin

10:45 Coffee Break ( 10:45 to 11:15 )

# Wednesday, August 28<sup>th</sup>

## Session II: Emerging Techniques in MRA / 4D flow / AI

- 11:15 Introduction, and Moderation — Oliver Wieben, and Said Moussaoui
- 11:20 Deep Learning for Fully Automated Preprocessing and 3D Segmentation of Aortic 4D-flow MRI
- Michael Scott — Northwestern University - Chicago
- 11:30 Artificial Intelligence Allows for Fully Automated 3D Segmentation of the Aorta from 4D-flow MRI
- Haben Berhane — Lurie Childrens Hospital of Chicago
- 11:40 An in Vitro and in Silico Validation Study for PC MRI and Derived Bio-markers
- Marco Castagna — Institut du Thorax of Université de Nantes and LHEEA Ecole Centrale Nantes
- 11:50 Regularization Parameter Optimization for Intracranial 4D-flow Imaging with Compressed Sensing
- Maria Aristova — Northwestern University - Chicago
- 12:00 Fusion of Computational Fluid Dynamics Flow Data into 4D-flow MRI Using Machine Learning
- Kevin Johnson — University of Wisconsin - Madison
- 12:10 Ungated 3D Stack-of-Stars QISS Fast Low-Angle Shot MR Angiography for High Resolution Evaluation of the Carotid Bifurcation: Initial Protocol Optimization at 3 Tesla
- Ioannis Koktzoglou — NorthShore University HealthSystem - Evanston
- 12:20 Initial Cardiac MR Experience with a Novel 84-element Coil
- Martijn Froeling — Utrecht University Medical Center

## Session II: Oral Posters

- 12:30 Wall Shear Stress Quantification in the Context of 4D-flow Magnetic Resonance Imaging Simulation on Carotids
- Sébastien Levilly — Ecole Centrale de Nantes - Laboratoire des Sciences du Numérique de Nantes
- 12:32 Automating Background Phase Correction in Cranial 4D-flow MRI
- Grant Roberts — University of Wisconsin - Madison
- 12:34 Twisting Jet through Stenotic Bicuspid Aortic Valve, a 4D-flow MRA Insight
- Jeesoo Lee — Northwestern University - Chicago

## 12:36 Challenging Clinical Case: TBD

12:45 Lunch and Poster Viewing ( 12:45 to 13:45 )

## 12:45 Early Career Mentoring ( 12:45 to 13:45 )

Speed mentoring session sponsored by the Early Career Committee



••• Trainee competing for Potchen or Passariello Award



# Scientific Sessions

## Session III: Abdominal MRA and Peripheral

- 13:45 Introduction, and Moderation — Elizabeth Hecht, and Peter Douglas
- 13:50 Free-breathing Fast Low-angle Shot Quiescent-interval Slice-selective MR Angiography for Improved Detection of Vascular Stenoses in the Pelvis and Abdomen  
*Ioannis Koktzoglou — NorthShore University HealthSystem - Evanston*
- 14:00 Non-contrast-enhanced Abdominal MRA at 3T using Velocity-selective Pulse Trains  
●●● *Dan Zhu — Department of Biomedical Engineering, Johns Hopkins School of Medicine - Baltimore*
- 14:10 FFR and Pressure Drop Assesment Across Severe Iliac Artery Stenosis: 4D-fow MRI-based Computational Fluid Dynamics vs. In-vivo Measurements  
●●● *Simeon Skopalik — University of Glasgow*
- 14:20 Improved Magnetic Resonance Angiographic Contrast Using Deep Transfer Learning Reconstruction  
*Ioannis Koktzoglou — NorthShore University HealthSystem - Evanston*

## Session III: Point / Counterpoint

### 14:30 Is MRA a Good Technique to Plan Radiology Guided Interventions or Surgery?

**Moderator: Winfried Willinek**

**Speaker 1, Point (pro): Scott Resnick**

**Speaker 2, Counterpoint (con): Yann Goueffic**

15:00 Coffee Break ( 15:00 to 15:30 )





# Wednesday, August 28<sup>th</sup>

## Session IV: Abdominal and Peripheral MRA

Moderators — Elizabeth Hecht, and Peter Douglas

- 15:30 4D-flow MRI and Doppler Wire Arterial Flow Analysis Pre-/Post-liver Embolization in Swine  
●● Carson Hoffman — University of Wisconsin - Madison
- 15:40 Elucidating Vascular Etiologies of Erectile Dysfunction Using Dynamic MR Angiography  
●● Alexandra Roudenko — Weill Cornell Medical Center, New York Presbyterian
- 15:50 Prevalence of IVC Stenosis in Autosomal Dominant Polycystic Kidney Disease  
Martin Prince — Weill Cornell Medical Center
- 16:00 Non-invasive Assessment of Splanchnic Flow in Patients using Mesenteric Ischaemia using MRI 4D-flow a Pilot Study  
Giles Roditi — University of Glasgow
- 16:10 Improved Magnetic Resonance Angiographic Contrast Using Deep Transfer Learning Reconstruction  
Ioannis Koktzoglou — NorthShore University HealthSystem - Evanston
- 16:20 Findings in Potential Living Donors of Kidneys: Retrospective Analysis of ceMRA/MRV (2009-2018)  
Manuela Aschauer — Medical University Graz

## Session IV: Oral Posters

- 16:30 Application of kZ-Space-based Processing for Providing Improved Through-plane Resolution in 2D Multi-slice Imaging of the Prostate  
Stephen Riederer — Mayo Clinic - Rochester
- 16:32 Phase Contrast MR Renal Blood Flow Characterizes Disease Progression in Autosomal Dominant Polycystic Kidney Disease  
Hreedi Dev — Weill Cornell Medical Center
- 16:34 Evaluating the Vessel Wall Permeability of Abdominal Aortic Aneurysm using 3D Dynamic Contrast-enhanced MRI: A Feasibility Study  
●● Bing Tian — Department of Radiology, Changhai Hospital - Shanghai

## 16:36 Clinical Challenges

**Co-moderators: Kevin DeMarco, Giles Roditi, and Elizabeth Hecht**

- 20:00 Evening Event: Les Machines de l'île (No Transportation available)  
Boulevard Léon Bureau, 44200 Nantes



# Scientific Sessions

## Thursday, August 29th (Registration at 07:30)

08:30 Welcome, Introduction, and Announcements

08:40 Opening Remarks

**08:45 Plenary Talk II — Kazuhiko Sadamoto Inaugural Lecture: Introduction  
Kazuhiko Sadamoto — Ehime University**

**08:50 Value of Imaging from a Health System Perspective: A World Perspective  
Howard Chrisman — Northwestern University - Chicago**

### Session V: Cardiac MRA

09:15 Introduction, and Moderation — Matthias Stuber, and Jean-François Deux

09:20 Free-running 3D Joint Myocardial T1 and T2 Mapping with Whole-heart Coverage and Isotropic Spatial Resolution

••• Haikun Qi — King's College - London

09:30 Biventricular Velocities and T2-Relaxation Times are Altered in Heart Transplant Patients with Cardiac Allograft Vasculopathy  
Roberto Sarnari — Northwestern University - Chicago

09:40 Single-bolus Quantitative 3D Myocardial Perfusion Imaging without Breath Holds or ECG Gating via Respiratory-compensated MR Multitasking  
Anthony Christodoulou — Cedars-Sinai Medical Center - Los Angeles

09:50 Quantifying Mitral Valve Regurgitation from 4D-flow MRI using Semi-automated Flow Tracking

••• Carmen Blanken — Academic Medical Centre, Universiteit van Amsterdam

10:00 3D Whole-heart Isotropic Resolution Motion Compensated Joint T1/T2 Mapping

••• Giorgia Milotta — King's College - London

### Session V: Oral Posters

10:10 The Effect of Cellular Rejection in Heart Transplant Patients Monitored for Cardiac Allograft Vasculopathy  
Roberto Sarnari — Northwestern University - Chicago

10:12 Chemical Exchange Saturation Transfer (CEST) Cardiovascular Magnetic Resonance for Assessment of Amyloid Light-chain Amyloidosis Patients  
Debiao Li — Cedars-Sinai Medical Center - Los Angeles

10:14 Quantifying Dynamic Characteristics of BAV and Associated Hemodynamics using Same-day Echocardiography and MRI

••• Jeessoo Lee — Northwestern University - Chicago

10:16 A Single Reference Variable Flip Angle Method for Accurate Dynamic T1 Quantification  
Seong-Eun Kim — University of Utah - Salt lake City

10:18 Self-navigated, Free-breathing 3D Left Atrial Late Gadolinium Enhancement MRI at 1.5 Tesla: A Preliminary Study for Evaluation of Image Quality and Quantification of Atrial Fibrosis in patients with Atrial Fibrillation

••• Suvai Gunasekaran — Northwestern University - Chicago

# Thursday, August 29<sup>th</sup>

## Session V: Oral Posters (Continued)

- 10:20 3D Whole-heart Free-breathing qBOOST-T2 Mapping  
●●● Georgia Milotta — King's College - London
- 10:22 Transfer Learning Produces Better Reconstruction of Highly-accelerated, Single-shot LGE Images than Conventional Deep Learning with Limited Training Data  
●●● Daming Shen — Northwestern University - Chicago
- 10:24 Artificial Intelligence Based Semi-automated Quantification of Left Atrial Flow Dynamics in Atrial Fibrillation  
●●● Justin Baraboo — Northwestern University - Evanston
- 10:30 Gold Sponsor Vendor Talk — Philips: Advances in Cardiovascular MR  
Mark Kouwenhoven
- 10:40 Coffee Break ( 10:40 to 11:10 )

## Session VI: Coronary MRA

- 11:10 Introduction, and Moderation — Rene Botnar, and Yibin Xie
- 11:30 Contrast Enhanced Compressed Sensing Coronary MRA: Preliminary Results  
Teruhito Mochizuki — Radiology, Ehime University School of Medicine
- 11:40 3D Whole-heart Imaging with Orientation-independent 2D Image Navigators  
Karl Kunze — Siemens Healthcare Ltd. - London
- 11:50 A Multi-scale Variational Neural Network for Accelerating Free-breathing Whole-heart 3D Coronary MR Angiography  
Niccolo Fuin — King's College - London
- 12:00 A Similarity-Based Data Clustering Approach for Fast Reconstruction of Untriggered and Ungated Whole-Heart MRA  
●●● John Heerfordt — Lausanne University Hospital (CHUV)
- 12:10 3D Whole-Heart Sub-Millimeter Isotropic Resolution Coronary MRA with Non-rigid Motion-compensated PROST  
Aurelien Bustin — King's College - London
- 12:20 Towards Single Breath-hold Whole-heart Coronary MRA Via Cross-domain Deep Learning  
Yibin Xie — Cedars-Sinai Medical Center - Los Angeles
- 12:30 Gold Sponsor Vendor Talk — Bayer: Optimizing Contrast Use for Cardiac MRI  
James Carr
- 12:40 Challenging Clinical Case: TBD
- 12:50 Lunch and Poster Viewing ( 12:50 to 13:45 )

# Scientific Sessions

## Session VII: Vessel Wall MRI

- 13:45 Introduction, and Moderation — David Saloner, and Liliana Ma
- 13:50 Progression of Plaque Burden on Intracranial Atherosclerosis Associated with Recurrent Stroke: A Follow-up Study by High-resolution Magnetic Resonance Imaging Shanghai
- Zhang Shi — Department of Radiology, Changhai Hospital - Shanghai
- 14:00 Proximal Region of Carotid Atherosclerotic Plaque Shows more Intraplaque Hemorrhage: The Plaque At RiSk (PARISk) Study  
Eline Kooi — Maastricht University Medical Center
- 14:10 Start of antiplatelet therapy increases the prevalence of intraplaque Hemorrhage in Patients with Advanced Carotid Artery Lesions: A Longitudinal MR Imaging Study  
Eline Kooi — Maastricht University Medical Center

## Session VII: Oral Posters

- 14:20 Performance of a dedicated carotid PET/MRI coil  
Eline Kooi — Maastricht University Medical Center
- 14:22 Radiomic Characteristics of Intracranial Atherosclerotic Plaques in Vitro: An initial study using high resolution MRI
- Zhang Shi — Department of Radiology, Changhai Hospital - Shanghai
- 14:24 Determining the Number of Neck Shape-specific Coils Required to Image the General Population  
Rock Hadley — University of Utah - Salt Lake City
- 14:26 Intracranial Vessel Wall Imaging of Cerebral Amyloid Angiopathy and Cerebral Amyloid Angiopathy-Related Inflammation  
Vance Lehman — Mayo Clinic - Rochester
- 14:28 The Assessment Value of Plaque Enhancement Load of Multiple Cerebrovascular Beds in New Cerebral Infarction Based on 3D MR Vessel Wall Imaging  
Bin Cui — Peking University, Aerospace Clinical College of Medicine - Beijing

## Session VII: Point / Counterpoint

### 14:30 Which do we Need more than Vascular Luminal Imaging: Plaque or Flow Imaging?

**Moderator: David Saloner**

**Value of Fow Imaging for Vascular Assessment**

**Speaker 1, Point (flow): Mike Hope**

**Value of Plaque Imaging for Vascular Assessment**

**Speaker 2, Counterpoint (plaque): Eline Kooi**

15:00 Coffee Break ( 15:00 to 15:30 )



## Session VIII: Vessel Wall MRI - Super-moderator TBA

Moderators — Chun Yuan, and Laura Eisenmenger

- 15:30 Wall Enhancement on Black Blood MRI is an Independent Predictor of Symptomatic Status of Unruptured Intracranial Saccular Aneurysm  
●●● Chengcheng Zhu — University of California - San Francisco
- 15:40 Co-existing Extracranial and Intracranial Artery Atherosclerotic Plaques Predict Future Cardiovascular Events: A MR Vessel Wall Imaging Study  
●●● Jin Li — Nanjing Medical University
- 15:50 Is It Necessary for Patients with Internal Carotid Artery Occlusion to Undergo 3D Head-neck MR Vessel Wall Imaging Before Endovascular Revascularization  
Huilin Zhao — Renji Hospital, Shanghai Jiao Tong University School of Medicine

## Session VIII: Oral Posters

- 16:00 Association between Intraplaque Hemorrhage and Ipsilateral Cerebral Blood Flow in Patients with Carotid Moderate to Severe Stenosis: A Multi-contrast MR Vessel Wall Imaging Study  
●●● Ran Huo — Peking University Third Hospital
- 16:02 Plaque Burden of Carotid Atherosclerotic Stenosis Influences Collateral Circulation  
Huimin Xu — Department of Radiology, Peking University Third Hospital
- 16:04 Deep Learning for Domain-invariant MR Carotid Artery Wall Segmentation  
Anna Danko — University of Calgary
- 16:06 Quantitative Assessment of Cerebral Aneurysms on Vessel Wall Imaging MRI  
Dennis Parker — University of Utah - Salt Lake City
- 16:10 Vessel Wall Imaging in Previously Unruptured, Untreated Brain Arteriovenous Malformations  
Laura Eisenmenger — University of Wisconsin - Madison
- 16:12 Assessing MS Lesions with Ferumoxytol Enhanced Susceptibility Weighted FLAIR  
Mark Haacke — Wayne State University - Detroit
- 16:14 Compare the Characteristics of Different Types Spontaneous Intracranial Artery Dissection on High Resolution MRI Vessel Wall Imaging  
Bing Tian — Department of Radiology, Changhai Hospital - Shanghai
- 16:16 An automatic grading method for severity of white matter lesions  
●●● Xiaomeng Wu — Beijing Institute of Technology
- 16:18 Application of ASL Technique for Carotid Artery Stenosis: Initial Experience  
Keiji Igase — Ehime University - Matsuyama
- 16:20 Imaging the Circle of Willis with 3D Time of Flight MRA: A Comparison Between Spiral and Cartesian Acquisition at 1.5T  
Matthew Lanier — Philips Healthcare - Cincinnati
- 16:22 Gold Sponsor Vendor Talk — Siemens: Advances in Flow Imaging  
Ning Jin

## 16:30 Technical Challenges

Co-moderators: Wiro Niessen, Giles Roditi

- 18:00 Evening Event: Château de la Poterie (Boarding: La Cite des Congres)  
La Poterie, 44240 La Chapelle-sur-Erdre

●●● Trainee competing for Potchen or Passariello Award

# Scientific Sessions

Friday, August 30<sup>th</sup> (Registration at 07:30)

**07:30 Diversity Session ( 07:30 to 08:30 )**

*Diversity session sponsored by the Early Career Committee*

08:30 Welcome, Introduction, and Announcements

08:40 Opening Remarks

**08:45 Plenary Talk III: Politics and Lobbying**

*Getting an Imaging Technique where it Should Be*

*Jean-Pierre Pruvo — Centre Hospitalier Régional Universitaire de Lille*

**Session IX: 4D-FLOW MRA in the Aorta**

09:15 Introduction, and Moderation — Alban Redheuil, and Gerhard Laub

9:20 4D-flow MRI Quantification of Flow Disorganization in Aging and Aortic Dilation

●●● Sophia Houriez-Gombaud-Saintonge — Laboratoire d'Imagerie Biomédicale - Paris

9:30 Feasibility and Wall Shear Stress Quantification Accuracy of Compressed Sensing Aortic 4D-flow MRI: A Dual-center, Dual-field Strength (1.5, 3T) Study  
*Emilie Bollache — Laboratory of Biomedical Imaging, Sorbonne Université*

9:40 Highly Accelerated Compressed Sensing 4D-flow for Evaluation of Aortic Hemodynamics

●●● Ashitha Pathrose — Northwestern University - Chicago

9:50 Arterial Stiffness in Bicuspid or Tricuspid Aortic Valve Aortopathy Assessed by 4D-flow MRI

*Ariel Fernando Pascaner — Universidad Favaloro - Buenos Aires*

**Session IX: Oral Posters**

10:00 Optimisation of Technical Factors for Contrast Enhanced MRA for Thoracic Outlet Syndrome

*Lirong Yin — Singapore General Hospital*

10:02 In vitro 4D Flow MRI high and Low Velocity Encoding Strategies Corroborate in Vivo 4D-flow Hemodynamics in the False Lumen of Type B Aortic Dissection Patients

*Bradley Allen — University of Wisconsin - Madison*

10:04 4D Phase-contrast MRI Study of the Hemodynamic Changes in the Aorta and its Branches Before and After Endovascular Treatment of the Aortic Dissection

●●● Benoit Cosset — Université de Lyon - Bron

10:06 4D Hemodynamic Signatures: A Novel Concept for the Evaluation of Abnormal Flow Dynamics in Aortic Valve Disease

*Mohammed S.M. Elbaz — Northwestern University - Chicago*

10:10 Coffee Break ( 10:10 to 10:55 )



## Session X: 4D-FLOW MRA in the Aorta

Moderators — Elie Mousseau, Emilie Bollache

- 10:55 4D Flow MRI-derived Pulse Wave Velocity Characterization in the Normal Aorta  
●● Kelly Jarvis — Northwestern University - Chicago
- 11:05 Effect of Beta-blocker Therapy on Aortic 3D Hemodynamics in Patients with Bicuspid Aortic Valve  
●● Amirhossein Mozafarykhamseh — Northwestern University - Chicago
- 11:15 Pressure and Flow Interplay in Aortic Dilation using 4D-flow Magnetic Resonance Imaging  
●● Bouaou Kevin — Sorbonne Université - Paris
- 11:25 Anatomic and Hemodynamic Predictors of False Lumen Growth Rate Among Patients with Medically Managed Type B Aortic Dissection  
Nicholas Burris — University of Michigan - Ann Arbor
- 11:35 3D MRI Morphometric Changes in Ascending Thoracic Aortic Aneurysm: Going Beyond Diameters  
Thomas Dietenbeck — Laboratoire d'Imagerie Biomédicale - Paris

## Session X: Oral Posters

- 11:45 Chest Wall Deformity from Tissue Expanders Identified on Chest MR Angiography of Perforator Flap Angiography Studies  
Hanieh Attari — Weill Cornell Medicine - Sunnyside
- 11:47 Assessment of Pulmonary Artery Stiffness in Patients With Heart Failure Using Cardiac Magnetic Resonance  
●● Xuewen Hou — Charité University Medicine Berlin and German Heart Institute Berlin
- 11:49 Correlations Between Cardiothoracic MRI and External Seismocardiogram Recordings  
●● Ethan Johnson — Northwestern University - Evanston
- 11:51 Gold Sponsor Vendor Talk — Guerbet: TBD

## Session X: Point / Counterpoint

### 12:00 MR Venography and Thrombus MR Imaging: Useful or Not?

Co-moderator: Francine Touveny, Martin Prince

Speaker 1, Point (pro): Giles Roditi

Speaker 2, Counterpoint (con): Jean-Francois Heautot

- 12:30 Challenging Clinical Case: TBD
- 12:40 Lunch and Poster Viewing ( 12:40 to 13:45 )



# Scientific Sessions

## Session XI: Contrast MRA

- 13:45 Introduction, and Moderation — Paul Finn, and Leonardo Rivera Rivera
- 13:50 Efficacy of Gadoterate Meglumine enhanced MRA in Evaluating Thoracic Aorta Diseases Compared with Gadobutrol Enhanced MRA
- Alyssa Singer — Northwestern University - Chicago
- 14:00 5D-flow MRI for Cardiac and Respiratory Motion-resolved 3D Hemodynamics Using Gadoterate Meglumine and Ferumoxytol
- Liliana Ma — Northwestern University - Chicago
- 14:10 Evaluation of Contrast Dynamics in the Juvenile German Swine as Applied to CE-MRA: A Study Using 4 Different Gadolinium Contrast Agents
- Jeffrey Maki — University of Colorado - Aurora
- 14:20 Ferumoxytol MR Angiography vs Doppler US for Vascular Mapping Before Haemodialysis Arteriovenous Access Creation
- Sokratis Stoumpos — Queen Elizabeth University Hospital - Glasgow
- 14:30 Ferumoxytol-Enhanced MRA for Evaluation of the Pulmonary Vascular Network
- Arash Bedayat — University of California - Los Angeles

## Session XI: Oral Posters

- 14:40 The Effect of the Injection Dose, Rate and Concentration on Carotid Dynamic Contrast-enhanced MRI: A Simulation Study
- Yajie Wang — Tsinghua University - Beijing
- 14:42 Correlation Based Perfusion Mapping Using Low-dose Time-resolved Contrast Enhanced MRA: Preloaded Contrast Media does not Affect its Image Quality
- Bum-soo Kim — Seoul St.Mary's Hospital, The Catholic University of Korea

## Session XI: Point / Counterpoint

### 14:45 We should Care about Gadolinium Retention

Moderator: Olivier Clement

Speaker 1, Point (pro): Mitsue Miyazaki

Speaker 2, Counterpoint (con): Jeff Maki

15:15 - Coffee Break ( 15:15 to 15: 45 )



## Session XII: Head and Neck MRA

- 15:45 Introduction, and Moderation — Kevin de Marco, and Hubert Desal
- 15:50 Towards Automated Cranial 4D Flow Cranial Analysis  
●●● Carson Hoffman — NorthShore University HealthSystem - Evanston
- 16:00 Multi-scale Brain Pulsatility Assessment Using Accelerated Spiral MRI: Initial Feasibility  
●●● Leonardo Rivera — University of Wisconsin - Madison
- 16:10 MRI Quantitative T2\* Mapping to Predict Dominant Composition of In Vitro Thrombus  
Romain Bourcier — University Hospital of Nantes
- 16:20 Multi-Modality Flow Analysis in Cerebral Aneurysms: Mass Conservation in 4D Flow and CFD Data  
Vitaliy Rayz — University of Wisconsin -Madison
- 16:30 Image processing of Phase contrast Magnetic Resonance Imaging to Investigate Cerebral Blood Flows  
Olivier Balédent — Purdue University - West Lafayette

## Closing Session ( 16:40 to 17:40 )

Acknowledgement of the SMRA Secretariat and Local Organizing Committee  
Jean-Michel Serfaty

Presentation of the Potchen Award and Passariello Awards  
Philippe Douek

Introduction of new SMRA Board Member and President-Elect  
Michael Markl

Announcement of and Invitation to the 2020 SMRA Meeting  
Giles Roditi

Closing Remarks

Evening Event: TBD



# Special Sessions

## Poster Exhibition

All Oral Poster presentation will be accompanied by a tradition printed poster.

Posters will be displayed throughout the conference (August 28th-30th) in the main conference venue Mezzanine level 2.

## Speed mentoring session sponsored by the Early Career Committee

This inaugural session will focus on connecting trainees in the early phases of their careers with experienced individuals with a wide array of specialties. The session will start with a panel discussion and break out into "speed mentoring", where participants rotate between mentors for brief introductions to foster networking and discussions throughout the meeting.

**Wednesday, August 28, Lunch ( 12:30 to 13:30 )**

## Diversity session sponsored by the Early Career Committee

This inaugural session will examine gender and minority representation in our society and will feature invited speakers with a wide array of experiences. The session will start with a focused panel discussion and break out to give participants opportunities to further discuss one-on-one. Breakfast will be served.

**Friday, August 30, Breakfast ( 07:30 to 8:30 )**

## Inaugural Kazuhiko Sadamoto Lecture

The SMRA community is extremely thankful for Dr. Kazuhiko Sadamoto's long-standing contributions and commitment to the SMRA.

In order to formally recognize these important contributions to the society, an annual invited keynote lecture - the 'Kazuhiko Sadamoto Lecture', featuring a prominent keynote speaker, will be held for the first time at the 2019 SMRA Conference:

**Thursday, August 29 ( 08:45 to 9:15 )**

08:45 Plenary Talk II — Kazuhiko Sadamoto Inaugural Lecture: Introduction  
Kazuhiko Sadamoto

08:50 Value of Imaging from a Health System Perspective: A World Perspective  
Howard Chrisman



# Break-out Sessions

## Break-out Hands-on Software Sessions with Vendors

One hour session, 10 to 12 Participants.

Please see registration desk for details and how to sign up.

### Wednesday, August 28th

13:30 Break-out Session I

15:30 Break-out Session II

### Thursday, August 29th

09:15 Break-out Session I

11:30 Break-out Session II

13:30 Break-out Session III

15:15 Break-out Session IV



# Awards

## Potchen Award

For the best oral presentation given by a trainee.

Dr. Potchen received his bachelor's degree from Michigan State University in 1954, his medical degree from Wayne State University in 1958, his master's degree in management from the Massachusetts Institute of Technology in 1973, and his law degree from the University of Michigan in 1984.

He became Professor and Chief of Diagnostic Radiology, at Mallinckrodt Institute of Radiology at Washington University School of Medicine, then Professor of Radiology and Dean of Management Resources at Johns Hopkins University School of Medicine. In 1975 he accepted the position as Professor and Chairman of the Department of Radiology at Michigan State University.

He has served on seven scientific journal editorial boards. He authored or edited 31 books and has been the author and co-author of 42 chapters in medical texts, in addition to 167 publications in the refereed press in the fields of chest radiology, neuroradiology, neuroscience, magnetic resonance, social economic implications of medical care, and the role of the university in technology transfer.

His major emphasis over the past 20 years in studying the quality of human decision making in Medicine, Business and Law. His emphasis has been on assessing decisions humans make and seeking to improve on the applications of technology to healthcare through improving the quality of decisions in the selections of alternative technologies and in their implementation.

## Passariello Award

For the best poster presentation given by a trainee.

Roberto Passariello was a greatly admired radiologist whose tireless dedication to his field is evident from the enormous body of literature he published during his career, the many congresses, seminars and courses he organized, and his work on the editorial boards of numerous scientific journals.

As well as serving as president of the ECR (1999) and the EAR (1999-2000), Passariello was president of the Italian Society of Cardiovascular and Interventional Radiology, the Italian Society of Magnetic Resonance Imaging, and the European Society of Magnetic Resonance in Medicine and Biology.

He received the ECR Gold Medal in 2003 for his outstanding contribution to and leadership in European radiology.



# Endorsements

## Society for Cardiovascular Magnetic Resonance (SCMR)

[scmr.org](http://scmr.org)

The Society for Cardiovascular Magnetic Resonance (SCMR) is the recognized representative and advocate for physicians, scientists, and technologists who work in the field of cardiovascular magnetic resonance (CMR). SCMR is the principal international, independent organization committed to the further development of CMR through education, quality control, research, and training.



# Acknowledgements

Funding for this conference was made possible (in part) by 1R13HL149441-01 from the National Heart, Lung and Blood Institute. The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the NIH; nor does mention by trade names, commercial practices, or organizations imply endorsement by the U.S. Government.

# Resident Sponsors

## Société Française de Radiologie

[sfrnet.org](http://sfrnet.org)

An association whose objective is to develop an expertise on all subjects concerning imaging and to ensure its dissemination.



## Société Française d'Imagerie Cardiaque Vasculaire

[sficv.com](http://sficv.com)

A multidisciplinary society whose active members are physicians interested in cardiac and / or vascular pathology.





# Pre-conference Venue

## L'unité de recherche de L'institut du Thorax

8 quai Moncousu, 44007 Nantes, France  
umr1087.univ-nantes.fr

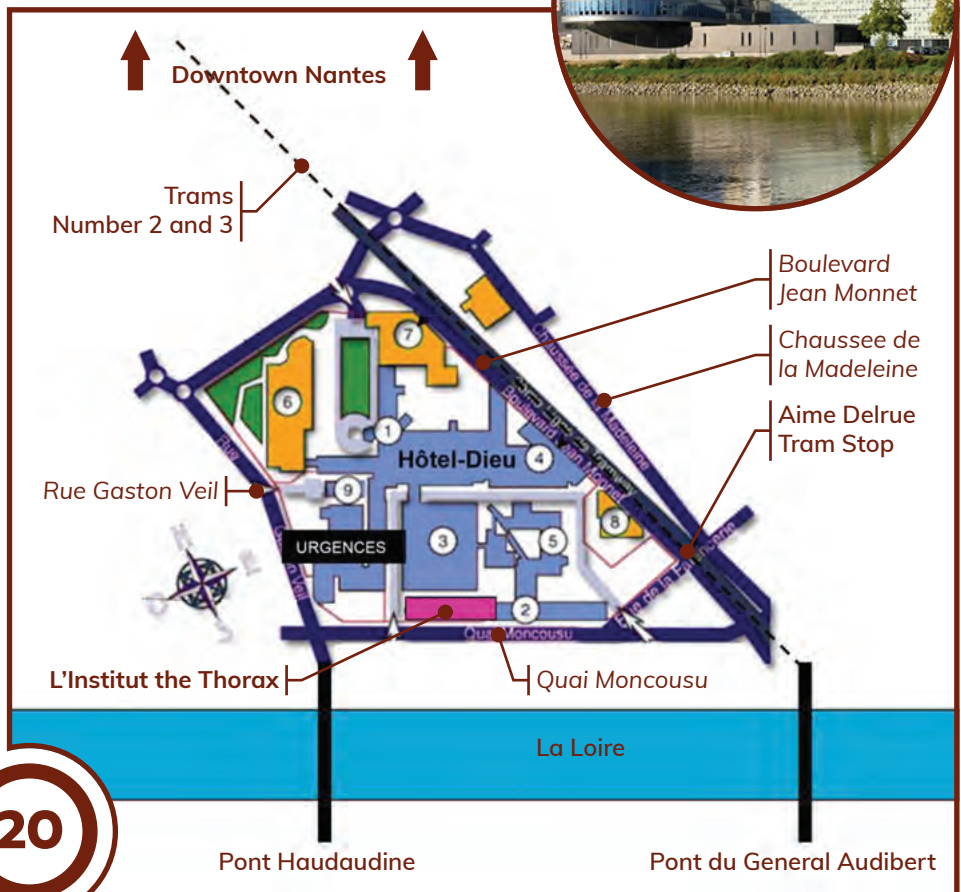
Founded in 2004, L'institut du Thorax is devoted to patient care, research and higher education in cardiovascular, metabolic and respiratory diseases. From bench to bedside, our scope reaches from a basic research lab (Inserm UMR 1087/CNRS UMR 6291) to clinical departments via a clinical investigation center.

The Educational workshop will be held in:

IRS-UN building

"Denis Escande" Amphitheatre

8 Quai Moncousu





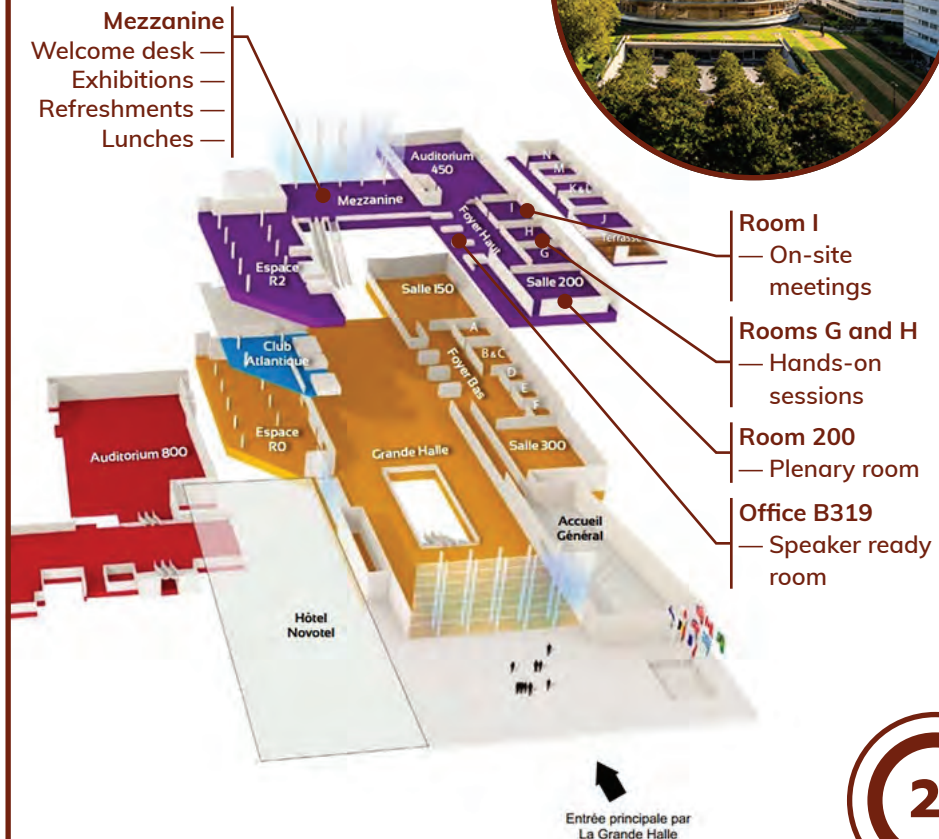
# Conference Venue

## La Cité des Congrès de Nantes

5 Rue de Valmy, 44000 Nantes, France  
lacite-nantes.com

Created over 25 year ago, La Cité Nantes Congress Centre has made a name for itself among the top French convention centres.

As an economic and cultural tool of global exposure, it is home to the most stunning French and global events and actively contributes to the reputation, attractiveness and development of the region.



# Explore Nantes

## Overview

Nantes is nestled on the Loire estuary, the longest river in France and last wild river in Europe. Here, the river is still influenced by the tides, and flows in both directions! The giant cranes still bear witness to the intense port activity which the city experienced up until the mid-20th century. Nowadays, the Loire acts as a backdrop for cultural activities, provides a haven for protected animals and plants and beckons people to enjoy the nearby beaches and coastline for relaxing or water sports.

As a city that was once home to the Dukes of Brittany, Nantes – a city which is Breton at heart – embodies the history of an area of transition between the countryside and the sea, between Brittany and the Loire, and between the roots of identity and the openness to discovery.

- Area: 25.17 mi<sup>2</sup>
- Weather: 66°F (19°C), Wind SW at 10 mph (16 km/h), 75% Humidity
- Local time: Wednesday 8:11 PM
- Population: 303,382 (2015) INSEE
- Mayor: Johanna Rolland
- Department: Loire-Atlantique



# Explore Nantes

## Cultural Adventure

Culture abounds in Nantes, with its 15 museums, 34 theatres and auditoriums, and numerous venues and events demonstrating its creative vibrancy: Folle Journée, the Machines on the Ile de Nantes, Royal de Luxe, Lieu Unique, Estuaire, and more. There is so much to discover during a short stay or throughout the entire year.

## Gastronomy and Wine

As the city of Petit Beurre LU biscuits and Muscadet wine, Nantes knows how to please its inhabitants! In addition to the renowned local specialities – seafood, Loire valley wines, boiled sweets and Nantes cake –, sailors have infused Nantes cuisine with world flavours over the centuries. The immediate vicinity of one of the main basins in France for growing fresh produce means that the city can make the most of some of the freshest and most varied products available. Countless markets and restaurants provide an opportunity to discover this unique culinary wealth, as it is cooked up by chefs going all out to be inventive.

## Getting around Nantes

Nantes's taxi number is +33 02 40 69 22 22. There are designated taxi waiting spots near Place du Commerce and the train station, but taxi service is infrequent.

Public transportation services are provided by TAN (Transports de l'Agglomération Nantaise) which consists of 3 tram lines, a BusWay, many bus lines, and several Navibuses. A one-way ticket costs €1.50. Once on the bus, tram, or navibus you must validate the ticket in one of the green ticket validation machines. The ticket is then active for one hour with unlimited transfers. Tickets are cheaper if you buy them in bulk (a "carnet" of 10 tickets costs €12.70) and there are also 24-hour (€4.20 for one person, or €6.70 for 4 people).



# Social Event

## Wednesday Evening, August 28th

Event begins at 20:00 (No Transportation available)

Les Machines de l'île

Boulevard Léon Bureau, 44200 Nantes

[www.lesmachines-nantes.fr](http://www.lesmachines-nantes.fr)

Les Machines de l'île is a totally unprecedented project. A product of François Delarozière and Pierre Orefice's collective imagination, it is the only place where you'll find Jules Verne's "Invented Worlds," the mechanical universe of Leonardo da Vinci, and Nantes' industrial history, all on the exceptional site of the city's former shipyards.

Some strange machines came to populate the Île de Nantes. After the Grand éléphant, this is now the turn of a Manta Ray, a Sea Snake and of all kinds of incredible boats to take possession of the banks of the Loire River in the Carrousel des Mondes Marins. These uncommon machines were born from the hands of the constructors of the company La Machine and came to life in between those of Les Machines de l'île before the public's eyes. Their backwards and forwards between the building workshop and the Galerie des Machines give impetus to the movement at the heart of the former Dubigeon warehouses. They convey a mysterious reality to this island just like the time when vessels were launched there for all the trips of the world.

## Thursday Evening, August 29th

Boarding boat: La Cite des Congres at 18:00, the boat leaves at 18:30

Château de la Poterie

La Poterie, 44240 La Chapelle-sur-Erdre

[www.chateaudelapoterie.com](http://www.chateaudelapoterie.com)

We will be taking a boat to the venue and returning by bus.

Magnificent Reception on the Erdre's Riverside. A little place of paradise at the end of the road...

Located on the Erdre's riverside, this nice Castle has been built near the City of NANTES on 18th Century by Ceineray's Architect.

In its vast, spacious park, in the shade of Century-old-trees, the Chateau de la Poterie welcomes you with elegant reception lounges to celebrate private cocktail party, dinner, exhibition and seminar or meeting.

It's authentic setting, the charm of the surrounding and the calmness of its stones, steeped in history and comfort of today, will assuredly seduce your guests.

## Friday Evening, August 30th: TBD

# Guest Program

## Take the Journey

Cost for the 3 days is \$250 USD

Street by street, from the Château des ducs de Bretagne to the Passage Pommeraye, and from the Musée d'Arts to the Galerie des Machines, Nantes reveals its historical, architectural and artistic riches.

Nantes bubbles and sparkles and will surprise with its vibrancy and its capacity to reinvent and renew itself.

To discover the city of dukes is to make the most of an exceptional heritage, where plant life lives side by side with urban development, where the artistic trail amazes with its contemporary installations and where public friendly spaces are reachable on foot and by bike.

## Wednesday August, 28th

09.00 Meeting with your guide in front of the Tourism Office  
9, rue des Etats – facing the Château des Ducs de Bretagne

City overview and the summer event « Voyage à Nantes.

Every summer the event Voyage à Nantes invit artists, designers, architects, etc. to express themselves in the public arena. Ephemeral installations, works of art, places where it's good to meet lead you on a journey of discovery across the town. Make the most of your day to discover the best of Nantes, a town tipped upside down by art : all along the green line with a selection of more than 10 unmissable stages

12.00 Cross the river Loire with the Navibus and have a lunch in Trentemoult, a quarter with narrow streets, colorful houses, taverns and terraces.  
Lunch at the restaurant "La Civelse": 3 courses, 1 glass of wine, coffee or tea.

13.30 After lunch, discover Trentemoult  
Trentemoult is part of Rezé, which stretches along the south of Nantes. It was once a fishing and Cape Horner village. Its traditional three-storey houses were built with the Loire's rise in water level in mind. The staircases were mainly outside, giving access to the upstairs rooms during times of flooding. In the second half of the 19th century, captains started to build bigger houses around the village. These more bourgeois houses had large gardens filled with flowers and exotic plants brought back from their travels. Building the quayside reduced the risk of floods, the last big ones happened in 1910 and 1935.

15.15 Cross the river back to the city center and have a tea time in "La Cigale"  
Opened in 1895, and a listed historical monument, La Cigale is a joyful example of Art Nouveau. A never-ending display of ornaments, associating painted wood and ceramic in a variety of blue tones.

15.45 Way back to the Tourism Office and end of the visit at 16.00

# Guest Program

## Thursday, August 29th

09.00 Meeting with your guide in front of the Tourism Office  
9, rue des Etats – facing the Château des Ducs de Bretagne

Discover Bouffay Quarter and the Château des Ducs de Bretagne  
The “Cité des Ducs” has middle ages characteristics to be proud of. The ‘place du Bouffay’ and its adjoining narrow streets are the echo of the businesses and communities that once reigned there. Timber-framed houses, visible remnants of the 15th and 16th century blend in with today’s shops, bars and restaurants in every imaginable style. It’s a place of crossroads and chance meetings; for going out, for shopping or just wandering through with the ever-present crowds.

Discover the Château des ducs de Bretagne built at the end of the 15th century by François II, the last Duke of Brittany and then its daughter, Anne of Brittany, twice Queen of France.

The castle, which sits between grandeur and renewal, is home to the History of Nantes museum and its contemporary scenography. It paints a portrait of the city from its origins to the modern metropolis of today. The history of the castle unfolds and unique historical objects relate the role played by Nantes in the European slave trade, daily life in Nantes during the two world wars and the major local industries (LU, BN, etc).

12.00 Complimentary lunch

13.30 Discover the botanical garden

It’s home to more than 10,000 species and more than 5000 flowers are planted each season. Its greenhouses have a surface area of 800 square metres. It’s been presented with the “Remarkable Garden” award and is among the four leading botanical gardens in France. The collections have developed and specialised over the last 150 years. It’s both a scientific garden and a garden for leisure and houses internationally recognised reference collections. It’s especially celebrated for its camellia collection (which is unique in France), its cultivation of epiphytic plants in semi-natural settings and for its concern for the reintroduction of rare species. An example of this is the wild Sylvestre tulip, which disappeared in the 1970s and was reintroduced in 2010 into the region’s vineyards.

15.45 Way back to the Tourism Office and end of the visit at 16.00





# Guest Program

## Friday, August 30th

- 09.00 Meeting with your guide and the bus in front of the Nantes Event Center  
Departure by bus to the Atlantic Coast – Crossing the salt marshes
- 10.15 Tour of Guérande  
Discover this medieval town with its cobbled streets and remparts.  
Guérande is in the heart of the peninsula called "Presqu'île guérandaise", along with other towns, such as La Baule, Le Croisic, Pornichet, Batz-sur-Mer, Le Pouliguen, or Piriac.
- 12.00 Arrival in La Baule: Complimentary lunch and free time  
La Baule, the longest beach in Europe, with pine forests, 19th century villas and prestigious buildings.
- 15.00 Way back to Nantes for an arrival at 16.00/16.30





# Gold Sponsors

**Bayer HealthCare**  
**[radiology.bayer.com](http://radiology.bayer.com)**

Bayer AG is a global leader in Radiology and offers solutions with products and services to support Radiologists achieving high quality contrast enhanced imaging in CT and MR. Clear Direction – From Diagnosis to Care.



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**Guerbet United States / France**  
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Guerbet offers a comprehensive range of pharmaceutical products, medical devices and services for diagnostic and interventional imaging, to improve the diagnosis and treatment of patients.

# Guerbet



# Gold Sponsors

## Philips Medical Systems

[usa.philips.com/healthcare/solutions/magnetic-resonance](https://usa.philips.com/healthcare/solutions/magnetic-resonance)

Royal Philips (NYSE: PHG, AEX: PHIA) is a leading health technology company focused on improving people's health and enabling better outcomes across the health continuum from healthy living and prevention, to diagnosis, treatment and home care. Philips leverages advanced technology and deep clinical and consumer insights to deliver integrated solutions. Headquartered in the Netherlands, the company is a leader in diagnostic imaging, image-guided therapy, patient monitoring and health informatics, as well as in consumer health and home care. Philips generated 2018 sales of EUR 18.1 billion and employs approximately 77,000 employees with sales and services in more than 100 countries.

# PHILIPS

## Siemens Healthcare GmbH

[siemens-healthineers.com](https://siemens-healthineers.com)

Siemens Healthineers enables healthcare providers worldwide to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, improving patient experience and digitalizing healthcare. A leader in medical technology, Siemens Healthineers is constantly innovating its portfolio of products and services in its core areas of diagnostic and therapeutic imaging and in laboratory diagnostics and molecular medicine. Siemens Healthineers is also actively developing its digital health services and enterprise services. Siemens Healthineers enables healthcare providers worldwide to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, improving patient experience and digitalizing healthcare.

# SIEMENS Healthineers

# Silver Sponsors

**GE Healthcare U.S.**

**[gehealthcare.com](http://gehealthcare.com)**

GE Healthcare est un des leaders dans le domaine de l'imagerie médicale. Il permet de développer la médecine de précision dans le diagnostic, le traitement et le suivi des patients



**Circle Cardiovascular Imaging, Inc.**

**[circlecvi.com](http://circlecvi.com)**

Circle provides an optimized Cardiac MR Reading & Reporting solution - cvi42 - to produce fast, accurate results with its Deep Learning trained algorithm for Cardiac function, tissue characterization and 2D/4D Flow.



## Additional Sponsors

**Arterys: [arterys.com](http://arterys.com)**

An AI company developing a medical imaging cloud platform to allow radiologists to view patient images in one click via their web browser to simplify their work and diagnosis.



**Bracco: [braccoimaging.com](http://braccoimaging.com)**

Bracco Imaging offers a product and solution portfolio for all key diagnostic imaging modalities: X-ray Imaging, MRI, CEUS, and Nuclear Medicine through radioactive tracers.



**Canon Medical: [eu.medical.canon](http://eu.medical.canon)**

Offering diagnostic medical imaging solutions; CT, X-ray, Ultrasound, MR and software for visualization and analysis of 2D, 3D and 4D images of anatomy and physiological functions.



**Heart Imaging Technologies: [heartit.com](http://heartit.com)**

Browser-based Precision CMR workflow solutions featuring structured reporting, collaborative remote read image sharing, a HL7 interface, and analysis tools to increase clinical volume.



# Additional Sponsors

## Medis Medical Imaging Systems: [arterys.com](http://arterys.com)

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## Pie Medical Imaging: [piemedicalimaging.com](http://piemedicalimaging.com)

Providing cardiovascular image analysis solutions which assist the medical professional to improve patient treatment. Caas MR Solutions is the powerhouse application to visualize and analyze cardiac MRI.



## Université de Nantes: [univ-nantes.fr](http://univ-nantes.fr)

Université de Nantes nurtures enthusiasm, audacity, generosity and courage. These principles, normally associated with youth, are our trademark.



## Pays de la Loire: [paysdelaloire.fr](http://paysdelaloire.fr)

Regional Council represent the people of Pays de la Loire providing administrative, education, heritage, and tourism services.



## Nantes Métropole: [nantesmetropole.fr](http://nantesmetropole.fr)

The capital of the Great West with 600,000 inhabitants. More than half of the territory consists of natural or agricultural areas. Growth and balance set the tone for its dynamics.



## Centre Hospitalier Universitaire de Nantes: [chu-nantes.fr](http://chu-nantes.fr)

Located in the center of Nantes and qualified as a university-hospital complex due to the proximity of the three faculties of medicine, pharmacy and odonto.



## Université Bretagne Loire: [u-bretagne Loire](http://u-bretagne Loire.fr)

A community of universities and institutions (ComUE) aiming to develop the scientific and academic potential of this territory at national and international level.



## Centrale Nantes: [ec-nantes.fr](http://ec-nantes.fr)

Founding by the city of Nantes to support French industrial development in the "lower Loire" region, Centrale Nantes has grown to be a world leading engineering school.



## Centre National de la Recherche Scientifique: [cnrs.fr](http://cnrs.fr)

One of the most important research institutions in the world. Meeting the great challenges of science; exploring the biology, the matter, the universe, and the functioning of human societies.



# SMRA 2019 Organization

The Society for Magnetic Resonance Angiography (SMRA) was founded in 1989 as the MR Angio Club to bring together scientists, clinicians and industry with a common interest in MR Angiography (MRA). The MR Angio Club formally Incorporated as the nonprofit Society for Magnetic Resonance Angiography (SMRA) in 2015. The society's annual conference is widely recognized as the sole international conference exclusively devoted to MR angiography. Each year, prominent researchers and clinicians come from all over the world to attend this event and present their most up to date research results and exchange ideas. MR-related vendors also showcase their state-of-the-art products, technical advances, and clinical applications in an engaging environment intended to foster new connections and collaborations.

## 2019 Executive Board

- Michael Markl — President
- Giles Roditi — President Elect
- Charles (Chuck) Dumoulin — Secretary
- Kevin DeMarco — Treasurer
- Richard Frayne
- James Carr
- Elizabeth Hecht
- Chun Yuan
- Manuela Aschauer

## SMRA Secretariat and Conference Management

- Janette Wallace
- Johanne Langford

## 2019 Conference Organizing Committee — Nantes

- Jean-Michel Serfaty — Conference Chair
- Philippe Douek — Conference Co-chair
- Michael Markl — President
- Giles Roditi — President-Elect
- Janette Wallace
- Johanne Langford
- Nadine Denoual
- Marco Castagna
- Sébastien Levilly



# Salutations

The scientific program was made possible with the help of our team of abstract reviewers and their rigorous selection.

## We would therefore like to thank the following:

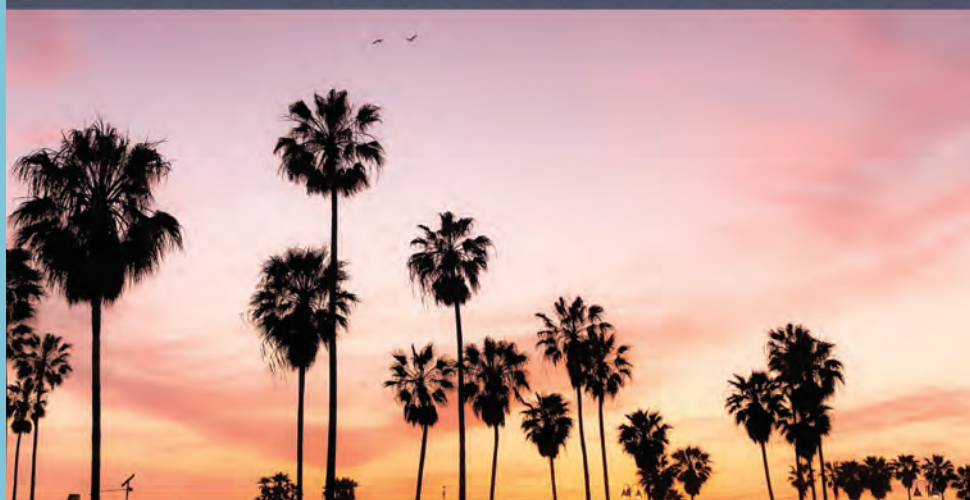
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## 2019 Volunteers

We would like to gratefully acknowledge all the staff and student volunteers for contributing their time and energy into making this event a success! It wouldn't have been possible without you. Thank you!



# Society for Magnetic Resonance Angiography 32nd Annual International Conference



## Los Angeles, CA

UCLA Meyer and Renee Luskin Conference Center

**August 26, 2020 | August 29, 2020**

**Solving Clinical Problems  
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