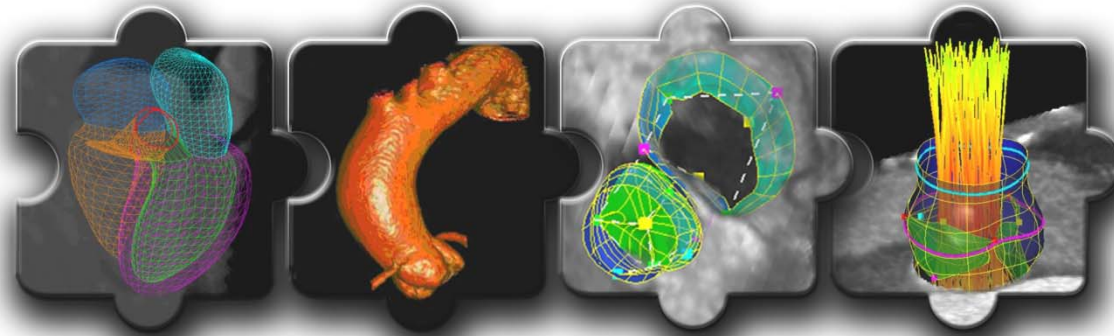


# Sim-e-Child

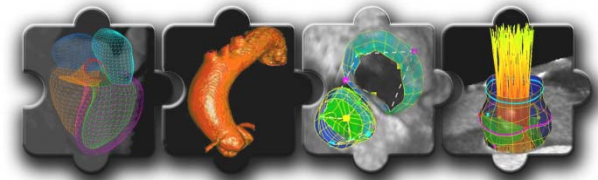
Grid-Enabled Platform for Simulations in Paediatric Cardiology  
Toward the Personalized Virtual Child Heart



Allen D. Everett, MD  
Pediatric Cardiology  
Johns Hopkins Hospital, USA

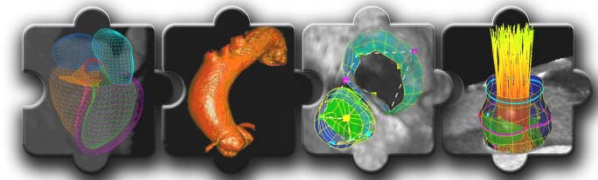
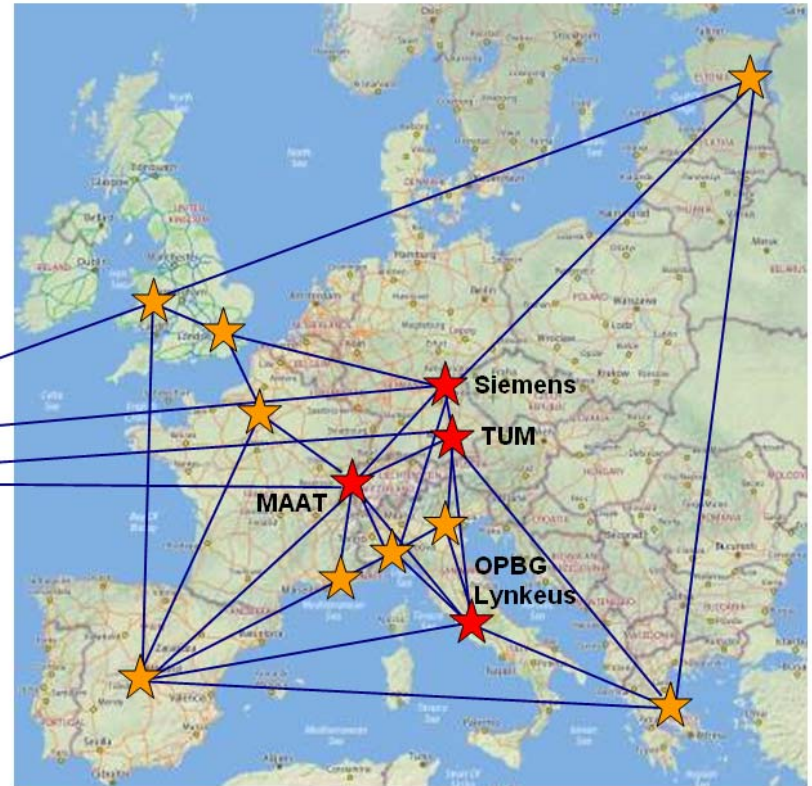
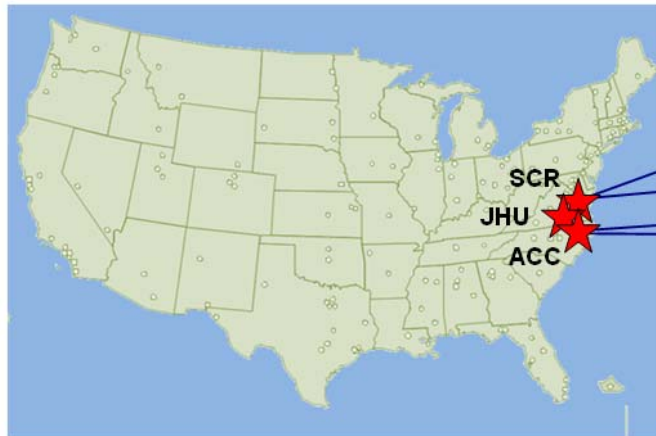
# Sim-e-Child

- The **Sim-e-Child** project proposes to develop a grid-enabled platform for large scale simulations in paediatric cardiology, providing a collaborative environment for constructing and validating multi-scale and personalized models of a growing heart and vessels.
- The objective of the **Sim-e-Child** is to strengthen the impact of the Health-e-Child project by creating an international simulation and validation environment for paediatric cardiology, supported by integrated data repositories. The project will advance the state-of-the-art by providing comprehensive and patient specific models for the dynamic and longitudinal interactions occurring in the left heart, with a focus on the congenital aortic arch disease and repair.



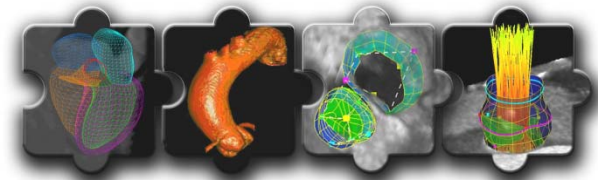
# Where is Sim-e-Child?

- ★ Health-e-Child
- ★ Sim-e-Child



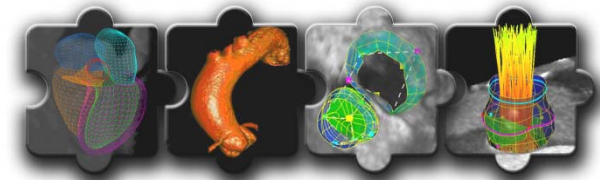
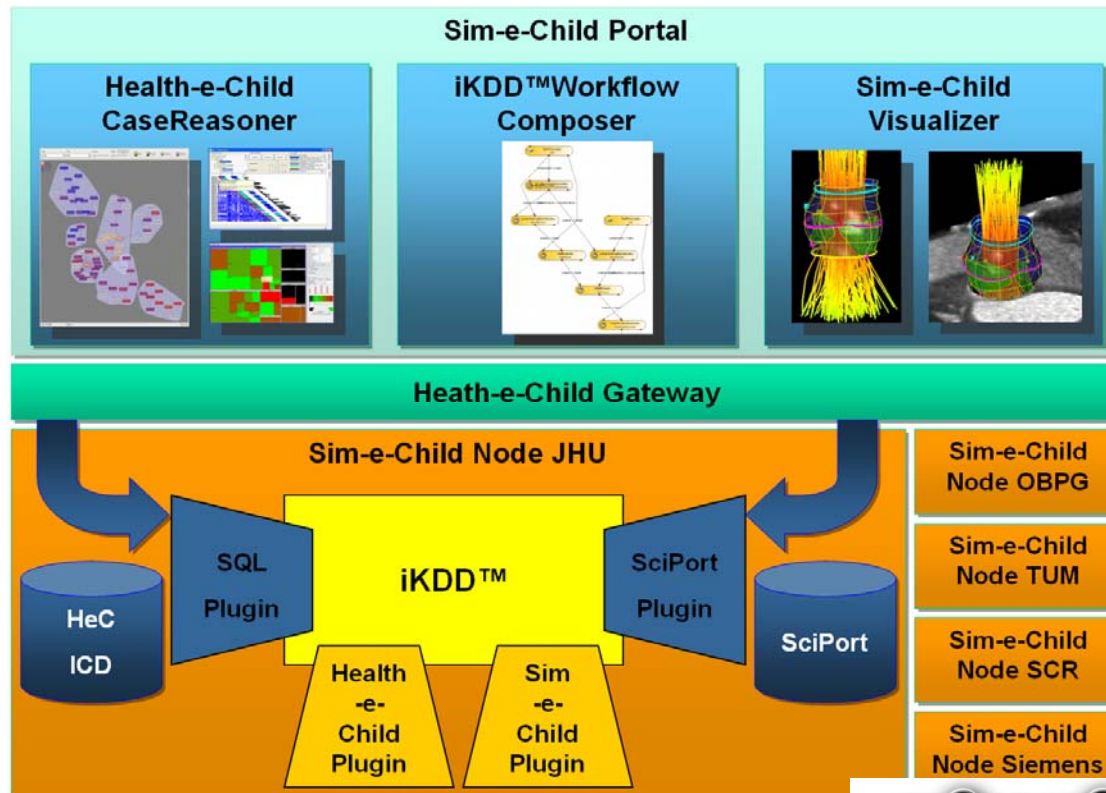
# Sim-e-Child and Health-e-Child

- **Health-e-Child models will be expanded** by integrating the existing Siemens Corporate Research (SCR) models of the **aorta, aortic valve and mitral valve** together with blood flow modelling and flow visualization from the Technical University of Munich.
- The new and comprehensive heart model will be applied to congenital aortic disease, thus enriching the portfolio of applications available in Health-e-Child and broadening its end-user community.



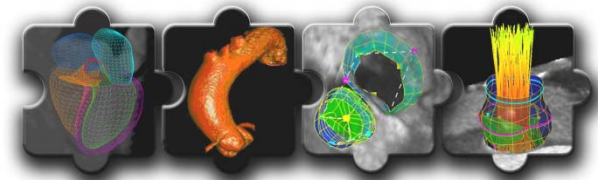
# Sim-e-Child Architecture

- **Sim-e-Child will integrate and extend several existing tools to build a powerful simulation, collaboration and validation platform.** A web portal will provide access to distributed clinical databases, help designing experimental workflows, submit them for computation, and retrieve and visualize the results.

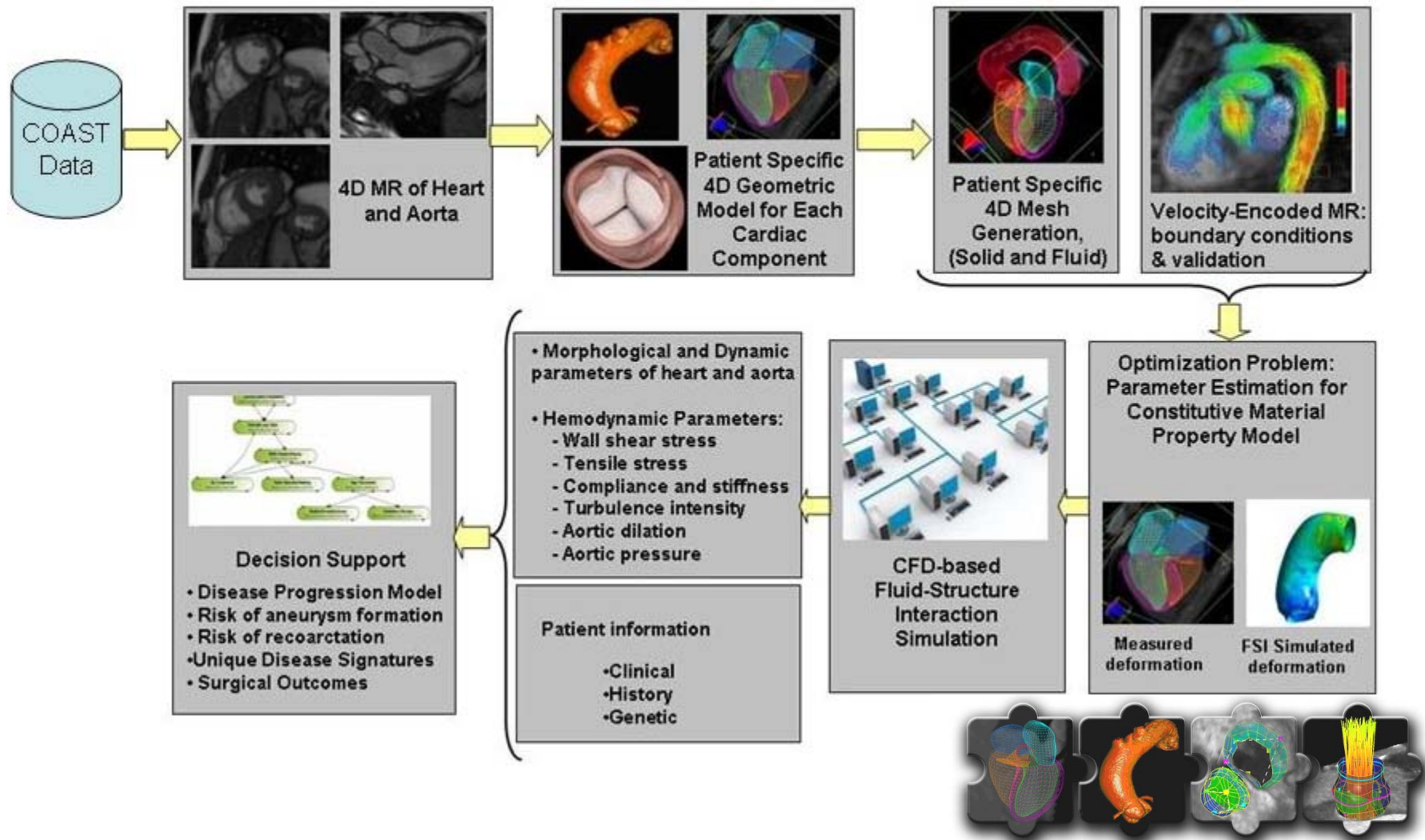


# Sim-e-Child and COAST

- **COAST (Coarctation Of Aorta Stent Trial)** a US FDA safety trial for bare metal stents for coarctation of the aorta.
- Pre and Post stent MRI studies will be used to model the aorta, aortic valve, left ventricle and mitral valve for personalized modeling for improved decision support.

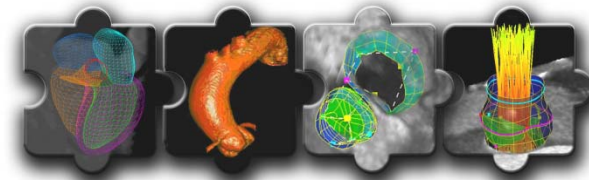
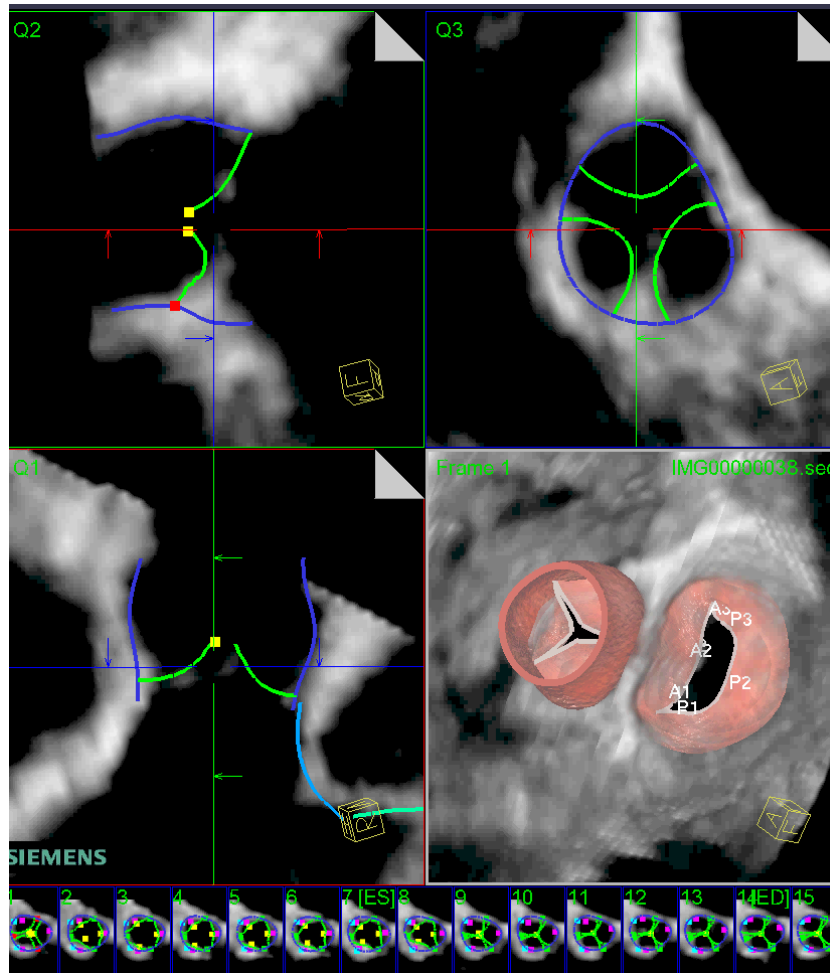


# Sim-e-Child Ultimate Aims

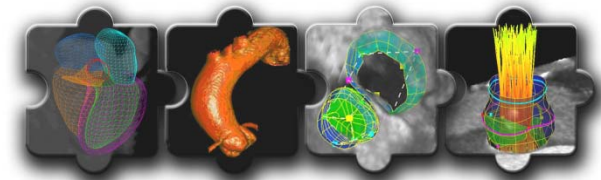
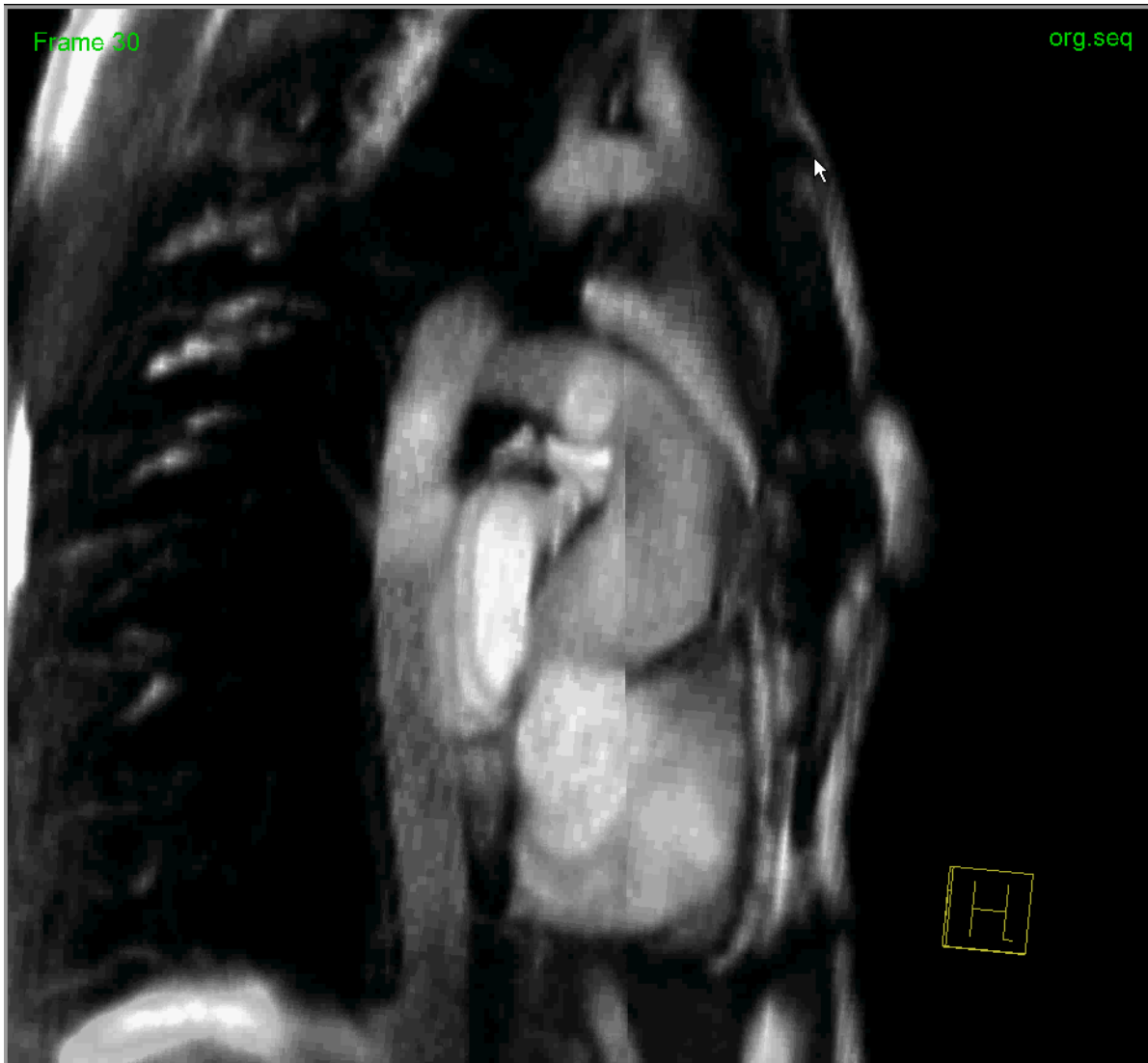


# Sim-e-Child Computer Modeling

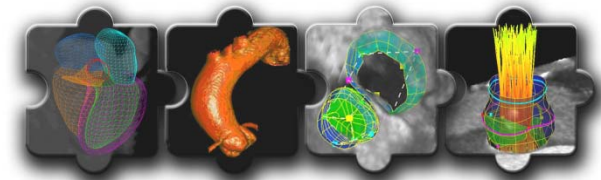
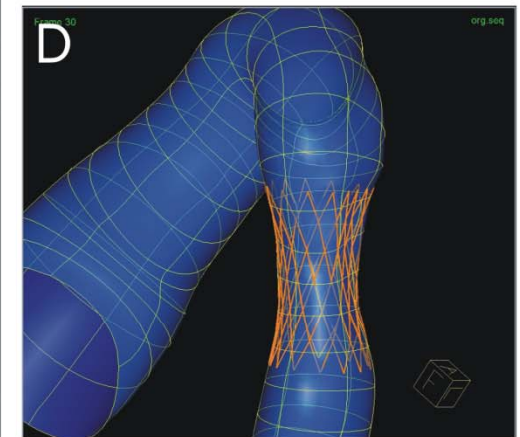
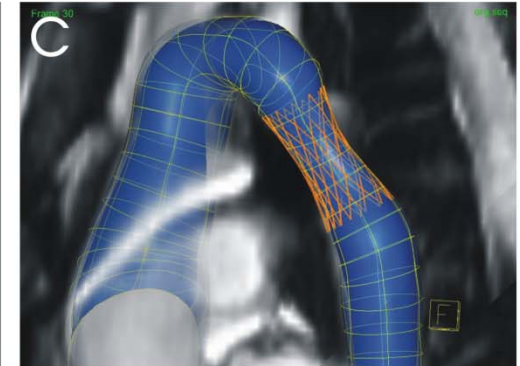
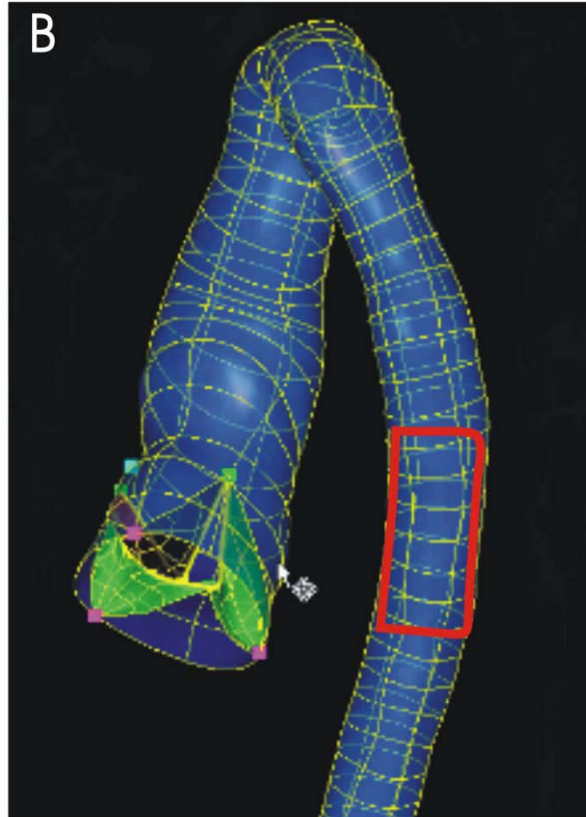
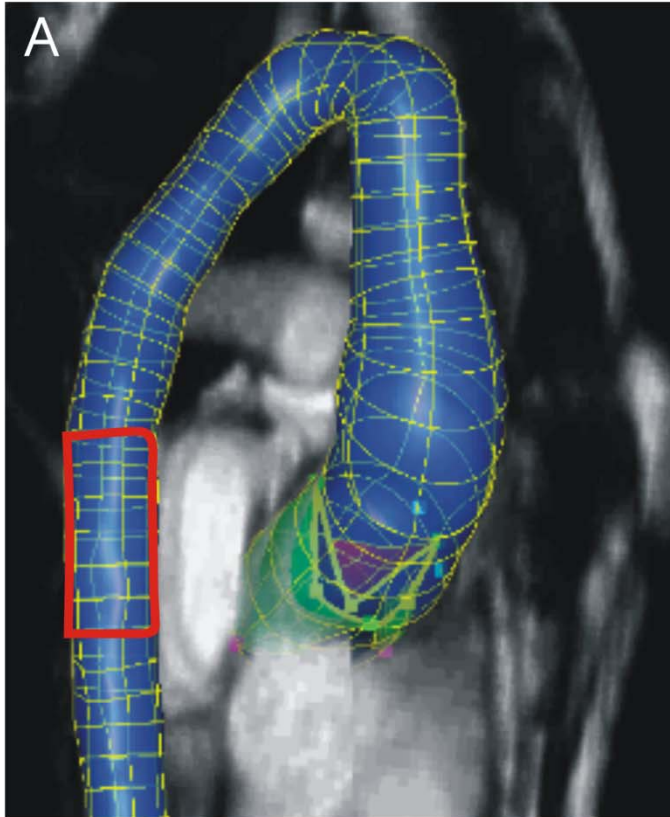
- Modeling of cardiac structures is advancing as shown in this CT based model of the aorta and mitral valve.



# Sim-e-Child: Modeling of Coarctation of the Aorta



# Sim-e-Child: Modeling of Coarctation



# Sim-e-Child Partners

Participant No.	Participant Organisation Name	Participant Short Name	Country
1 (Coordinator)	Siemens AG, Erlangen	Siemens	Germany
2	Lynkeus SRL, Rome	Lynkeus	Italy
3	MAAT, Archamps	MAAT	France
4	Technical University Munich	TUM	Germany
5	I.R.C.C.S. Ospedale Paediatrico Bambino Gesù, Rome	OPBG	Italy
6	Siemens Corporate Research, Princeton NJ	SCR	USA
7	Johns Hopkins University, Baltimore MD*	JHU	USA
8	American College of Cardiology, Washington, DC	ACC	USA

