

2025 International Workshop on Pulmonary Imaging

February 27 - March 1, 2025



Thursday

February 27th, 2025

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| 7:00 – 7:40 AM | Continental Breakfast |
| 7:40 – 7:50 AM | Introductory Remarks Rahim Rizi, Ph.D. <i>University of Pennsylvania</i> |
| 7:50 – 8:00 AM | Welcome Remarks S. William Stavropoulos, M.D. Interim Chair, Department of Radiology <i>University of Pennsylvania</i> |
| Session I: Keynote Lectures – Part I <i>Moderator: Eric P. Schmidt, M.D.</i> | |
| 8:00 – 8:25 am | Novel Pathways in the Pathogenesis of COPD James Crapo, M.D. <i>National Jewish Health</i> |
| 8:25 – 8:45 am | Structural Predictors of Lung Function Decline in Young Smokers with Normal Spirometry Wisla Wedzicha, M.D., Ph.D. <i>Imperial College London</i> |
| 8:45 – 9:05 am | CT Assessed Sildenafil Effects on Regional Pulmonary V/Q in a Smoking and Non-smoking Population Eric A. Hoffman, Ph.D. <i>University of Iowa</i> |

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| 9:05 – 9:25 am | Leveraging CT Scan Findings to Understand Emphysema Pathobiology in COPD Francesca Polverino, M.D., Ph.D. <i>Baylor College of Medicine</i> |
| 9:25 – 9:45 am | The Lungs and Heart are Connected Precisely: Cardiopulmonary Interactions of Machine-learned CT Emphysema Subtypes R. Graham Barr, M.D., DrPH <i>Columbia University</i> |
| 9:45 – 10:00 am | Discussion |
| 10:00 – 10:15 am | Break |
| Session II: Keynote Lectures – Part II Moderator: George R. Washko, M.D. | |
| 10:15 – 10:35 am | Adaptable Human Endothelium for Organ Regeneration and Radiation Mitigation Shahin Rafii, M.D. <i>Cornell University</i> |
| 10:35 – 10:55 am | Mucus Plugging – A New Phenotype in Practice Mario Castro, M.D., MPH <i>University of Kansas Medical Center</i> |
| 10:55 – 11:15 am | Defining Ideal and Impaired Respiratory Health: A Step Toward Health Promotion and Disease Interception Gabrielle Liu, M.D., M.S. <i>University of California, Davis</i> |
| 11:15 – 11:35 am | Circulating Glycosaminoglycans as Critical Illness Biomarkers Eric P. Schmidt, M.D. <i>Harvard Medical School, Massachusetts General Hospital</i> |
| 11:35 – 11:55 am | Insights into Pulmonary Vascular Disease from Hyperpolarized Xenon MRI Sudar Rajagopal, M.D., Ph.D. <i>Duke University</i> |
| 11:55 – 12:15 pm | Biovariability of Quantitative Lung Measures During the Menstrual Cycle Jessica Sieren, Ph.D. <i>University of Iowa</i> |
| 12:15 – 12:25 pm | Discussion |

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| 12:25 – 1:10 pm | Lunch |
| Session III: Early Investigators <i>Moderator: Shampa Chatterjee, Ph.D.</i> | |
| 1:10 – 1:20 pm | ^{129}Xe in the Clinic: First Impressions, Use Cases, and Future Directions Robby Thomen, Ph.D. <i>University of Missouri</i> |
| 1:20 – 1:30 pm | Same-day Repeatability of Hyperpolarized ^{129}Xe MRI Features in Patients with Pulmonary Arterial Hypertension and Systemic Sclerosis Peter Niedbalski, Ph.D. <i>University of Kansas Medical Center</i> |
| 1:30 – 1:40 pm | Alveolar Structural Dynamics During Mechanical Ventilation: Insights from Multiscale Dynamic Imaging Jacob Herrmann, Ph.D. <i>University of Iowa</i> |
| 1:40 – 1:50 pm | Unsupervised Machine Learning Technique for Analyzing Lung Ultrasound Hersh Sagreiya, M.D. <i>University of Pennsylvania</i> |
| 1:50 – 2:00 pm | Assessing Physiological Outcomes of Endobronchial Valve Intervention Using Hyperpolarized Xenon Cine MRI During Spontaneous Breathing Hooman Hamedani, Ph.D. <i>University of Pennsylvania</i> |
| 2:00 – 2:10 pm | Exploring COPD Phenotypic Landscape Using Elastic Principal Graphs Sundaresh Ram, Ph.D. <i>Emory University & Georgia Institute of Technology</i> |
| 2:10 – 2:25 pm | Discussion |
| 2:25–2:40 pm | Break |
| Session IV: Radiation-induced Lung Injury <i>Moderator: David Mankoff, M.D., Ph.D.</i> | |
| 2:40 – 2:55 pm | Interstitial Lung Abnormalities (ILA): A Radiologist's Perspective Hiroto Hatabu, M.D., Ph.D. <i>Brigham and Women's Hospital</i> |

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| 2:55 – 3:10 pm | 4DCT Artifact Detection and Correction for Functional Lung Avoidance Radiation Therapy Joseph Reinhardt, Ph.D. <i>University of Iowa</i> |
| 3:10 – 3:25 pm | Medical Countermeasures for Radiation-induced Lung Injury Heather Himburg, Ph.D. <i>Medical College of Wisconsin</i> |
| 3:25 – 3:40 pm | Artificial Intelligence-assisted Lung Modeling with Application to Early Detection of Radiation-induced Lung Injury Reza Avaz, Ph.D. <i>Texas A&M University</i> |
| 3:40 – 3:55 pm | Experience the Profound Clinical Impact of NAEOTOM Alpha (Photon-counting CT) in Thoracic Imaging Matthew Fuld, Ph.D. <i>Siemens Healthineers</i> |
| 3:55 – 4:10 pm | Discussion |
| 4:10 – 4:25 pm | Break |
| Session V: ARDS Moderator: Maurizio Cereda, M.D. | |
| 4:25 – 4:40 pm | Distribution of Lung Expansion and Strains at the PEEP of Maximal Compliance Marcos Vidal Melo, Ph.D. <i>Columbia University</i> |
| 4:40 – 4:55 pm | Efficacy of Multi-Frequency Ventilation in Acute Lung Injury: A Quantitative CT Imaging Assessment David Kaczka, M.D., Ph.D. <i>University of Iowa</i> |
| 4:55 – 5:10 pm | ARDS: A Syndrome in Distress Pratik Sinha, Ph.D. <i>Washington University in St. Louis</i> |
| 5:10 – 5:25 pm | Imaging to Understand Heterogeneous and Individualized Treatment Effects Nadir Yehya, M.D. <i>Children's Hospital of Philadelphia</i> |

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| 5:25 – 5:40 pm | Phenotyping and Characterization of Lung Injury by CT Scan Using AI in Spontaneously Breathing Patients with Respiratory Failure Emanuele Rezoagli, M.D., Ph.D. <i>University of Milano-Bicocca</i> |
| 5:40 – 5:55 pm | Quantitative and Functional Cardiothoracic Imaging in the Era of Artificial Intelligence: The Road to Transforming Clinical Practice Eduardo Barbosa, M.D. <i>University of Pennsylvania</i> |
| 5:55 – 6:10 pm | Distribution of Lung Ventilation Strain and Subsequent Inflammation: A Translational PET-CT Study Gaetano Perchiizzi, M.D., Ph.D. <i>Uppsala University</i> |
| 6:10 – 6:25 pm | Effects of Abdominal and Thoracic Mass Loading on Respiratory Mechanics and Lung Volumes in a Swine Model of Acute Hypoxemic Respiratory Failure Maurizio Cereda, M.D. <i>Harvard Medical School, Massachusetts General Hospital</i> |
| 6:25 – 6:40 pm | Discussion |
| Friday <i>February 28th, 2025</i> | |
| 7:00 – 8:00 am | Continental Breakfast |
| Session VI: ILD and Fibrosis <i>Moderator: Sean B. Fain, Ph.D.</i> | |
| 8:00 – 8:15 am | Radiation Therapy Treatment Planning Approaches for Mitigation of RILI John Bayouth, Ph.D. <i>Oregon Health & Science University</i> |
| 8:15 – 8:30 am | Multiparametric PET-MR Imaging of Pulmonary Fibrosis Iris Zhou, Ph.D. <i>Harvard Medical School, Massachusetts General Hospital</i> |
| 8:30 – 8:45 am | Hyperpolarized ¹²⁹Xe MRI Membrane Uptake Associates with Changes in Lung Function and Prognosis in Patients with Idiopathic Pulmonary Fibrosis Initiating Therapy Robert Tighe, M.D. <i>Duke University</i> |

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| 8:45 – 9:00 am | Association of CT-Assessed Dysanapsis with Subclinical Interstitial Lung Disease in Older Adults Anna Podolanczuk, M.D. <i>Cornell University</i> |
| 9:00 – 9:10 am | Discussion |
| 9:10 – 9:20 am | Break |
| Session VII: Machine Learning and Deep Learning in Pulmonary Imaging <i>Moderator: Joseph Reinhardt, Ph.D.</i> | |
| 9:20 – 9:35 am | Communicating Variability in Deep Learning CT Reconstructions with Posterior Sampling Grace Gang, Ph.D. <i>University of Pennsylvania</i> |
| 9:35 – 9:50 am | Identifying Subtypes of Human Disease Using Ontology-based Machine Learning Justin Reese, Ph.D. <i>Lawrence Berkeley National Laboratory</i> |
| 9:50 – 10:05 am | Large-scale Harmonization of Emphysema Measures Andrew Laine, Ph.D. <i>Columbia University</i> |
| 10:05 – 10:20 am | Deep Learning-based Classification of Usual Interstitial Pneumonia on CT is Associated with Progression of Interstitial Lung Abnormalities in the COPDGene Study Stephen Humphries, Ph.D. <i>National Jewish Health</i> |
| 10:20 – 10:35 am | ITK-Lung: A Software Framework for Lung Image Processing and Analysis James Gee, Ph.D. <i>University of Pennsylvania</i> |
| 10:35 – 10:50 am | Pulmonary Image Synthesis: Intensity Transforms and Beyond Sarah Gerard, Ph.D. <i>University of Iowa</i> |
| 10:50 – 11:05 am | Imaging and Computational Biomarkers in Long COVID Patients: A Three-year Follow-up Ching-Long Lin, Ph.D. <i>University of Iowa</i> |

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| 11:05 – 11:15 am | Discussion |
| 11:15 – 11:25 am | <i>Break</i> |
| Session VIII: Graduate Student Presentations <i>Moderator: Hooman Hamedani, Ph.D.</i> | |
| 11:25 - 11:31 am | Association of Contrast Enhanced Dual Energy CT-derived Pulmonary Arterial Tree-to-Lung Ratio (ArtLR) with COPD Soheil Hosseini, M.Sc. <i>University of Iowa</i> |
| 11:31 - 11:37 am | 3D Phase-resolved Functional Lung MRI as a Predictor of Treatment Outcomes in Severe Eosinophilic Asthma Patients Undergoing Mepolizumab Therapy Filip Klimes, Ph.D. <i>Hannover Medical School</i> |
| 11:37 - 11:43 am | 3D UTE Phase-Resolved Functional Lung (PREFUL) MRI in Neonates with Bronchopulmonary Dysplasia Samal Munidasa, Ph.D. <i>Cincinnati Children's Hospital Medical Center</i> |
| 11:43 - 11:49 am | Distinguishing Dose-dependent Radiation Lung Injury Using Hyperpolarized ¹²⁹Xe MR Spectroscopy Luis Loza, B.Sc. <i>University of Pennsylvania</i> |
| 11:49 - 11:55 am | Oxygen-enhanced MRI (OE-MRI) Biomarkers of Ventilation and Gas Uptake Correlate with Pulmonary Function Tests in Cystic Fibrosis Sarah Needleman, Ph.D. <i>University College London</i> |
| 11:55 - 12:01 pm | DCE-MRI Quantifies Microvascular Changes in Lung Transplant Recipients with Chronic Lung Allograft Rejection Antonia Susnjar, Ph.D. <i>Harvard Medical School</i> |
| 12:01 - 12:07 pm | 3D Ultrashort Echo Time (UTE) and 2D Dynamic MRI for Evaluating Ventilation and Chest Wall Motion in Pediatric Pectus Malformation Patients Bochun Mei, B.S. <i>University of California, San Francisco</i> |

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| 12:07 - 12:13 pm | T1 Mapping in the Lungs Using a Variable Flip Angle Approach with UTE-MR Saman Khodaei, M.Sc. <i>University of Iowa</i> |
| 12:13 – 12:23 pm | Discussion |
| 12:23 – 1:10 pm | Lunch |
| Session IX: Pre-COPD and Small Airways – Part I Moderator: Baskaran Sundaram, M.D. | |
| 1:10 – 1:25 pm | The Specific Physiological Properties Assessed by Different Imaging Methods of Ventilation and Perfusion Tilo Winkler, Ph.D. <i>Harvard Medical School, Massachusetts General Hospital</i> |
| 1:25 – 1:40 pm | Indoor Air Pollution and COPD Morbidity: The Role of CT in Identifying High-risk Populations Sarath Raju, M.D. <i>Johns Hopkins University</i> |
| 1:40 – 1:55 pm | Silent Zone Revealed: A Computational Imaging Approach for Small Airways Disease Staging in COPD Craig Galban, Ph.D. <i>University of Michigan</i> |
| 1:55 – 2:10 pm | Thoracic Respiratory Biomarkers in COPD Punam Saha, Ph.D. <i>University of Iowa</i> |
| 2:10 – 2:20 pm | Discussion |
| 2:20 – 2:35 pm | Break |
| Session X: Dynamic Airway Collapse (Tracheomalacia) in Children: How Bronchoscopy and Novel Imaging Techniques Inform Surgical Decisions Moderators: Joseph Piccione, D.O., MS & Jason Woods, Ph.D. | |
| 2:35 – 2:50 pm | MRI in the Neonate as a Contributor to Outcomes Improvement Jason Woods, Ph.D. <i>Cincinnati Children's Hospital Medical Center</i> |

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| 2:50 – 3:05 pm | Dynamic Airway Computed Tomography and Flexible Bronchoscopy for Diagnosis of Tracheomalacia in Children - A Comparison Study Jordan Rapp, M.D. & Aoife Corcoran, M.D. <i>Children's Hospital of Philadelphia</i> |
| 3:05 – 3:20 pm | Using Fluid Dynamics and Work of Breathing to Guide Treatment in Neonates Alister Bates, Ph.D. <i>Cincinnati Children's Hospital Medical Center</i> |
| 3:20 – 3:35 pm | Surgical Approaches for Tracheomalacia Tom Hamilton, M.D. <i>Children's Hospital of Philadelphia</i> |
| 3:35 – 3:50 pm | Discussion |
| 3:50 – 4:05 pm | Break |
| Session XI: Proton MRI of the Lung Moderator: John Mugler, Ph.D. | |
| 4:05 – 4:25 pm | 1H Functional Lung MRI: State of the Art and Future Perspectives Jens Vogel-Claussen, M.D. <i>Hannover Medical School</i> |
| 4:25 – 4:45 pm | 1H Pulmonary MRI Methods: Structure/function Mapping and Multi-parametric Imaging Peder Larson, Ph.D. <i>University of California, San Francisco</i> |
| 4:45 – 5:05 pm | Pulmonary Imaging Using 0.55T MRI Adrienne Campbell-Washburn, Ph.D. <i>National Institutes of Health</i> |
| 5:05 – 5:20 pm | Discussion |
| 5:20 – 5:30 pm | Break |
| Session XII: Poster Session and Reception | |
| 5:30 – 8:00 pm | <i>Poster presentations and reception (Smilow Commons)</i> |
| Saturday March 1 st , 2025 | |

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| 7:00 – 7:45 am | Continental Breakfast |
| Session XIII: Imaging of Lung Transplant and Cell Therapy <i>Moderator: Joel D. Cooper, M.D.</i> | |
| 7:45 – 8:00 am | Advances in Lung Transplantation: A Tale of Successes and Unsolved Conundrums Christian Bermudez, M.D. <i>University of Pennsylvania</i> |
| 8:00 – 8:15 am | Enhancing Normothermic <i>Ex Situ</i> Preservation: Valuable Insights and Lessons from Heart Perfusion Alvaro Rojas-Pena, M.D. <i>University of Michigan</i> |
| 8:15 – 8:30 am | Repair of Lung Injury by Human Lung Progenitors in Xenotransplant Model Nicolino Dorrello, M.D., PhD. <i>Columbia University</i> |
| 8:30 – 8:45 am | Assessment of Lung Function in Transplant Patients Using Hyperpolarized ¹²⁹Xe MRS Kai Ruppert, Ph.D. <i>University of Pennsylvania</i> |
| 8:45 – 9:00 am | The Role of Eosinophils in Early and Late Stages of Lung Allograft Immunoregulation Alexander Sasha Krupnick, M.D. <i>University of Maryland</i> |
| 9:00 – 9:15 am | Cellular Senescence in Donor's Lung as a Risk Factor for Developing Chronic Rejection Mauricio Rojas, M.D. <i>Ohio State University</i> |
| 9:15 – 9:30 am | X-ray Velocimetry to Predict Outcome in Endobronchial Valve Placement Trishul Siddharthan, M.D. <i>University of Miami</i> |
| 9:30 – 9:45 am | Discussion |
| 9:45 – 10:00 am | Break |
| Session XIV: Advances in CT Imaging and Photon Counting <i>Moderator: Sean B. Fain, Ph.D.</i> | |

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| 10:00 – 10:15 am | Photon-counting CT: Unlocking New Opportunities in Diagnostic Imaging Peter Noel, Ph.D. <i>University of Pennsylvania</i> |
| 10:15 – 10:30 am | Ensuring Precise Lung CT Quantification Amid Technological Variabilities Ehsan Abadi, Ph.D. <i>Duke University</i> |
| 10:30 – 10:45 am | Taking a Closer Look: HiP-CT for Detailed Lung Vasculature Analysis Adam Szmul, Ph.D. <i>University College London</i> |
| 10:45 – 11:00 am | PixelPrint4D: A 3D Printing Method for Fabricating Patient-specific Deformable Pulmonary CT Phantoms Jessica Im, Ph.D. <i>University of Pennsylvania</i> |
| 11:00 – 11:15 am | Discussion |
| 11:15 – 11:30 am | Break |
| Session XV: Lung Imaging with Hyperpolarized ^{129}Xe – Part I <i>Moderator: Rachel Eddy, Ph.D.</i> | |
| 11:30 – 11:45 am | Untangling Dyspnea Using ^{129}Xe MRI and Spectroscopy Bastiaan Driehuys, Ph.D. <i>Duke University</i> |
| 11:45 – 12:00 pm | Technical Developments in ^{129}Xe MRI for Clinical Implementation Jim Wild, Ph.D. <i>University of Sheffield</i> |
| 12:00 – 12:15 pm | Xe MRI in Pediatric Rare-lung Diseases and Bone-marrow Transplantation Laura Walkup, Ph.D. <i>Cincinnati Children's Hospital Medical Center</i> |
| 12:15 – 12:30 pm | The Membrane in the Middle: Interstitial Lung Diseases on Xenon MRI David Mummy, Ph.D. <i>Duke University</i> |
| 12:30 – 12:45 pm | Discussion |
| 12:45 – 1:30 pm | Lunch |

Session XVI: Lung Imaging with Hyperpolarized ^{129}Xe – Part II

Moderator: Laura Walkup, Ph.D.

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| 1:30 – 1:45 pm | Hyperpolarization Decay During Acquisition: What it Breaks and How to Fix it Analytically Juan Parra-Robles, Ph.D. <i>Cincinnati Children's Hospital Medical Center</i> |
| 1:45 – 2:00 pm | Exploratory Study of Vascular Consequences from Electronic Cigarette Use by ^{129}Xe MRI in Healthy Young Adults: A Pilot Study to Design a Multi-center Clinical Trial Y. Michael Shim, M.D. <i>University of Virginia School of Medicine</i> |
| 2:00 – 2:15 pm | Ventilation Defect Burden Predicts Lung Cancer Resection Outcomes Sarah Svenningsen, Ph.D. <i>McMaster University</i> |
| 2:15 – 2:30 pm | Clinical Applications of Xenon MRI Alex Dusek <i>Polarean Inc.</i> |
| 2:30 – 2:45 pm | Discussion |
| 2:45 – 3:00 pm | Break |
| Session XVII: Pre-COPD and Small Airways – Part II Moderator: Kai Ruppert, Ph.D. | |
| 3:00 – 3:15 pm | Beyond the Basics: Leveraging Advanced Ventilation Metrics to Differentiate Lung Health and Disease in Xenon MRI Chase Hall, M.D. <i>University of Kansas Medical Center</i> |
| 3:15 – 3:30 pm | Uncovering Silent Zones of Disease in COPD Sandeep Boddhuluri, Ph.D. <i>University of Alabama at Birmingham</i> |
| 3:30 – 3:45 pm | Mucus Pathology from Imaging Observations to Interventions Alejandro Diaz, M.D., MPH <i>Massachusetts General Hospital, Brigham and Women's Hospital</i> |

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| 3:45 – 4:00 pm | Lung Function and Airway Epithelial Barrier Integrity in Primary Cools Using LPG or Biomass: An Imaging-based Assessment Alejandro Comellas, M.D. <i>University of Iowa</i> |
| 4:00 – 4:15 pm | Discussion |
| 4:15 – 4:30 pm | Break |
| Session XVIII: Clinical Translation and Latest Technical Developments Moderator: Kiarash Emami, Ph.D. | |
| 4:30 – 4:45 pm | TBA TBA |
| 4:45 – 5:00 pm | Ventilation Lung Imaging Using Proton-hyperpolarized Gas Contrast Agents and RASER Sensing Using Proton-only Clinical MRI Scanners Eduard Chekmenev, Ph.D. <i>Wayne State University</i> |
| 5:00 – 5:15 pm | Hyperpolarized Propane Gas Imaging with a Point-of-care MRI Scanner and Exploring “Continuous-flow” HPXe Production with a “Stopped-flow” Hyperpolarizer Boyd Goodson, Ph.D. <i>Southern Illinois University</i> |
| 5:15 – 5:30 pm | Closing Remarks |
| 5:30 pm | Adjourn |