Submission Categories for 2023 Annual Meeting

Educational
- Arthur Boyer Award for Innovation in Medical Physics Education

Professional
- Professional Practice/Leadership
- Clinical Practice
- Administration/Regulatory/Quality Management

Scientific
- **Imaging Physics**
  - **Radiography/Fluoroscopy**
    - Acquisition Imaging Physics and Novel Systems
    - Calibration and QA/QC
    - Clinical Applications
    - Dosimetry and Safety
    - Dual-Energy, Multi-Energy, or Spectral Imaging
    - Image Processing/Analysis/Segmentation/Registration/CAD
    - Image Quality - Measurement, Modeling, and Artifact Corrections
    - Photon-counting Imaging
    - Quantitative Imaging
    - Radiomics / Imaging Genomics
    - Virtual Tools and Phantoms
  - **Multi-detector CT**
    - Acquisition Imaging Physics and Novel Systems
    - Calibration and QA/QC
    - Clinical Applications
    - Dosimetry and Safety
    - Dual-Energy, Multi-Energy, or Spectral Imaging
    - Dynamic imaging (Time-resolved/4D imaging)
    - Image Processing/Analysis/Segmentation/Registration/CAD
    - Image Quality - Measurement, Modeling, and Artifact Corrections
    - Photon-counting Imaging
    - Protocol Management/Optimization
    - Quantitative Imaging
    - Radiation dose reduction
    - Radiomics / Imaging Genomics
    - Reconstruction
    - Virtual Tools and Phantoms

- o **Cone-beam CT**
  - Acquisition Imaging Physics and Novel Systems
  - Breast Imaging
  - Calibration and QA/QC
  - Clinical Applications
  - Dental Imaging
  - Dosimetry and Safety
  - Dual-Energy, Multi-Energy, or Spectral Imaging
  - Dynamic imaging (Time-resolved/4D imaging)
  - Image Processing/Analysis/Segmentation/Registration/CAD
  - Image Quality - Measurement, Modeling, and Artifact Corrections
  - Photon-counting Imaging
  - Protocol Management/Optimization
  - Quantitative Imaging
  - Radiation dose reduction
  - Radiomics / Imaging Genomics
  - Reconstruction
  - Virtual Tools and Phantoms
- o **Mammography/Tomosynthesis**
  - Acquisition Imaging Physics and Novel Systems
  - Calibration and QA/QC
  - Clinical Applications
  - Dosimetry
  - Dual-Energy, Multi-Energy, or Spectral Imaging
  - Dynamic imaging (Time-resolved/4D imaging)
  - Image Processing/Analysis/Segmentation/Registration/CAD
  - Image Quality - Measurement, Modeling, and Artifact Corrections
  - Photon-counting Imaging
  - Quantitative Imaging
  - Radiomics / Imaging Genomics
  - Reconstruction
  - Virtual Tools and Phantoms
- o **Nuclear Medicine, PET and PET/MR**
  - Acquisition Imaging Physics and Novel Systems
  - Attenuation Correction and Reconstruction
  - Calibration and QA/QC
  - Clinical Applications
  - Dosimetry and Safety
  - Dynamic Imaging (Time-resolved/4D PET/SPECT/PET-MR)
  - Image Processing/Analysis/Segmentation/Registration/CAD
  - Image Quality - Measurement, Modeling, and Artifact Corrections
  - Quantitative Imaging
  - Radiomics / Imaging Genomics
  - Reconstruction
  - Theranostics
  - Virtual Tools and Phantoms

- **MRI**
  - Acquisition Imaging Physics and Novel Systems
  - Calibration and QA/QC
  - Clinical Applications
  - Dynamic Imaging (Time-resolved/4D imaging)
  - Image Processing/Analysis/Segmentation/Registration/CAD
  - Image Quality - Measurement, Modeling, and Artifact Corrections
  - Quantitative Imaging
  - Radiomics / Imaging Genomics
  - Reconstruction
  - Safety
  - Virtual Tools and Phantoms

- **Pre-Clinical (Small Animal) Imaging Systems**
  - Small-Animal Therapy-related Systems **(Please submit under Therapy Track)**
  - CBCT
  - CT
  - MRI
  - Multi-modality
  - New and Emerging Modalities
  - Nuclear Medicine, PET and PET/MR
  - Optical
  - Quantitative Imaging
  - Virtual Tools and Phantoms

- **Optical**
  - Acquisition Imaging Physics and Novel Systems
  - Calibration and QA/QC
  - Clinical Applications
  - Image Processing/Analysis/Segmentation/Registration/CAD
  - Image Quality - Measurement, Modeling, and Artifact Corrections
  - Quantitative Imaging
  - Radiomics / Imaging Genomics
  - Reconstruction
  - Virtual Tools and Phantoms

- **New and Emerging Technology**
  - Clinical Applications
  - Novel Contrast Agents and Nanoparticles for Imaging
  - Quantitative Imaging
  - Radiomics / Imaging Genomics
  - Virtual Tools and Phantoms
  - X-Ray Fluorescence Imaging
  - X-ray imaging with distributed sources
  - X-Ray Phase-Contrast Imaging

- **Multi-Modality Imaging**
  - Acquisition Image Physics and Novel Systems
  - Calibration and QA/QC

- Clinical Applications
- Dosimetry
- Image Processing/Analysis/Segmentation/Registration/CAD
- Image Quality - Measurement, Modeling, and Artifacts corrections
- Quantitative Imaging
- Radiomics / Imaging Genomics
- Reconstruction
- Virtual Tools and Phantoms
  - o **Other Imaging Related Topics**
    - Novel Applications
    - Low Resource/Global Technologies
- **Multi-Disciplinary**
  - o **Imaging in Treatment Planning, Image Guidance, and Adaptive Radiation Therapy**
    - CT or Cone-Beam CT
    - Novel Imaging Modalities
    - Image Registration: Single-Modality
    - Image Registration: Multi-Modality
    - Segmentation: Novel Methods
    - Applications in Therapy Guidance
    - Molecular Imaging in Treatment Planning
    - Functional Imaging in Treatment Planning
    - Deformable Image Registration
    - Real-time Imaging and Tracking
    - Adaptive Radiation Therapy
    - Online Replanning
    - 4D Imaging
    - Surface Guided Imaging
  - o **MRI in Radiation Therapy**
    - MRI for Treatment Planning and Target Definition
    - In-Room MRI for Therapy Guidance
    - Real-time Imaging and Tracking
    - Pre-treatment Motion Assessment/Management
    - MRI Calibration and QA
    - MRSI, DCE and Other Novel Techniques for Planning
    - MRI for Assessment of Therapy Response
    - MRI QA for Therapy: MR-SIM and MR-IGRT
    - MRI for Adaptive Therapy
  - o **Treatment Response Assessment**
    - kV/MV Fluoroscopy / Projection Imaging
    - kV/MV CT or Cone-Beam CT
    - Nuclear Medicine, PET, and PET/MR
    - MRI
    - Novel Modality
    - Multi-Modality Imaging
    - Radiomics / Imaging Genomics **(Please submit under Imaging Track or Data Science Specialty Track)**

- **Imaging for Particle Therapy**
  - kV/MV Fluoroscopy / Projection Imaging
  - kV/MV CT or Cone-Beam CT
  - Proton Radiography / Proton CT
  - Nuclear Medicine (PET, Prompt Gamma etc)
  - Novel Modality
  - MRI
  - Motion Management for Particle Therapy
  - Range or dose verification
- **Image Guidance for Surgical and Other Interventions (not Radiation Therapy)**
  - Surgical Planning
  - Interventional Imaging (All Modalities)
  - Tracking and Navigation
  - Robotics
  - Image-Guided Ablative Therapy (RF, Cryo, Thermal, etc.)
  - OR Safety
  - Quality Assurance and Imaging Dose
- **Radiobiology and Small Animal Systems (Please submit under Therapy Track)**
- **Other Multi-Disciplinary Related Topics**
  - Novel Applications
  - Novel Image Guidance Modalities
  - Low Resource/Global Technologies
  - Radiomics / Imaging Genomics **(Please submit under Imaging Track or Data Science Specialty Track)**
  - 3D Printing
- **Science Council Session (Topic: Innovations in Medical Physics)**
  - Innovations in Medical Physics
- **Quantitative Imaging**
  - QI Phantoms - Physical or Synthetic (Digital Reference Object)
  - QI Data Acquisition Strategies
  - QI Phantoms
  - QI Data Analysis Strategies
  - QI Applications: Pre-Clinical and Clinical Trials
  - Metrology - Assessment of Bias and Variance in Data Acquisition or Analysis
  - Harmonization of Data Acquisition and Data Analysis Across Vendors and Centers
  - Applications of QI: Pre-Clinical and Clinical Trials
  - Applications of QI: Treatment Guidance
  - Applications of QI: Treatment Assessment

- **Therapy**
  - **Imaging for Planning (Please submit under Multi-Disciplinary Track)**
  - **Photon Therapy - SBRT/SRS**
    - Image Guidance **(Please submit under Multi-Disciplinary Track)**
    - Imaging for Verification **(Please submit under Multi-Disciplinary Track)**
    - 4D Treatment Planning
    - Inverse Planning and Optimization Techniques
    - Planning and Dose Calculation Methods
    - Plan Evaluation Including Statistics and Robustness Analysis
    - Treatment Delivery Techniques and Novel Applications
    - Dose Measurement Tools and Equipment QA
    - Biological Modeling
  - **Photon External Beam Therapy**
    - Image Guidance **(Please submit under Multi-Disciplinary Track)**
    - Imaging for Verification **(Please submit under Multi-Disciplinary Track)**
    - Adaptive Radiation Therapy **(Please submit under Multi-Disciplinary Track)**
    - 4D Treatment Planning
    - Inverse Planning and Optimization Techniques
    - Planning and Dose Calculation Methods
    - Monte Carlo Dose Calculation
    - Biological Modeling
    - Plan Evaluation-Statistics and Robustness Analysis
    - Plan Evaluation-Comparison Studies
    - Treatment Delivery Techniques and Novel Applications
    - IMRT or VMAT Patient-specific QA: Film, EPID, Array
    - IMRT or VMAT Patient-specific QA: Novel Methods
    - EPID-based Portal Dosimetry Patient-specific QA
    - In vivo Dosimetry (non EPID-based)
    - QA of Linear Accelerators and Ancillary Systems
    - Novel Dosimeters (gel, chemical, etc.)
    - Secondary Dose Calculation/Verification
    - FLASH Techniques
  - **Immobilization Technology**
    - External Immobilization Methods
    - Internal Immobilization Methods (balloon etc.)
    - Imaging for Motion Management **(Please submit under Multi-Disciplinary Track)**
  - **Electron Beam Therapy**
    - Treatment Delivery Techniques and Novel Applications
    - Dose Calibration and Verification
    - Planning and Dose Calculation
    - FLASH Techniques
  - **Brachytherapy and Radiopharmaceuticals**
    - HDR Techniques
    - LDR Techniques
    - Planning and Dose Calculation

- Biological Modeling
- Brachytherapy QA
  - o **Particle Therapy (Protons and Heavy Ions)**
    - Image Guidance **(Please submit under Multi-Disciplinary Track)**
    - Imaging for Range Verification **(Please submit under Multi-Disciplinary Track)**
    - 4D Treatment Planning
    - Proton Beam Delivery Techniques
    - Heavy Ion Beam Delivery Techniques
    - Planning and Optimization Techniques (including robustness analysis)
    - Plan Evaluation-Comparison Studies
    - Dose Measurement Tools and Equipment QA
    - Dose Calculation and Calculation Tools
    - Biological Effect and Modeling
    - Uncertainties and Range Verification
    - Motion Management in Particle Therapy
    - FLASH Techniques
  - o **Outcome Modeling and Assessment**
    - Imaging for Therapy Assessment (**Please submit under Multi-Disciplinary Track)**
    - Late Effects
    - Early Effects
  - o **Patient Safety and Quality Improvement**
    - Incident Learning
    - Risk Analysis
    - Statistical Process Control
    - Novel QA Systems and Approaches **(for IMRT QA submit under Photon External Beam Therapy)**
  - o **Radiobiology and Small Animal Systems**
    - Pre-Clinical Radiobiology and Imaging Studies
    - Novel Systems for Small Animal Experiments
    - Radiobiological Modeling
    - Clinical Studies
    - Nanoparticles in Imaging and/or Therapy
  - o **Radiation Protection and Shielding**
    - Brachytherapy
    - Photon Therapy
    - Particle Therapy
  - o **Targeted Radionuclide Therapies**
    - Novel Radionuclide Therapies
    - Image Guidance **(Please submit under Multi-Disciplinary Track)**
- **Specialty Track: Ultrasound**
  - o **Ultrasound in Radiation Therapy**
    - Quality Assurance
    - Robotic US Guidance
    - US guidance in Brachytherapy
    - Monitoring or verification of Therapy
    - Motion Tracking

- Image Registration with US for Patient Positioning
- Ultrasound Imaging of Therapy Response
- Ultrasound Treatment Planning
  - **Therapeutic Ultrasound**
    - High-Intensity Therapeutic Ultrasound Devices
    - Ultrasound Hyperthermia/Thermal Ablation
    - Low Intensity Pulsed Ultrasound
    - Advanced and Novel Delivery Systems
    - Small Animal Systems
    - Image Guidance and Assessment (US, MRI,CT)
    - Treatment Planning
    - Therapy Modeling & Control
    - Drug Delivery, Activation, & Enhancement
    - Clinical Therapy
    - Ultrasound Therapy Standards
    - HIFU/Ultrasound with Radiation Therapy
    - HIFU and Immunotherapy
    - Motion Modeling
    - Dosimetric Effects
    - Delivered Dose
  - **Other Therapy Related Topics**
    - Novel Applications
    - Low Resource/Global Technologies
  - **Ultrasound Imaging**
    - Acquisition Image Physics and Novel Systems
    - Calibration, QA/QC, and Safety
    - Clinical Applications
    - Contrast Agents
    - Emerging Ultrasound Imaging Technology
    - Image processing/analysis/segmentation/registration/CAD
    - Image Quality - Measurement & Modeling
    - Image Registration for Diagnostic Radiology
    - Molecular Imaging
    - Photo-Acoustic Ultrasound
    - Preclinical/Small Animal
    - Quantitative Imaging
    - Ultrasound Elastography
    - Ultrasound Imaging of Therapy Response
- **Specialty Track: Data Science**
  - **Data Science/Radiomics/Computing**
    - Association with Genomics
    - Autoplanning
    - Autosegmentation
    - Clinical decision making
    - Clinical Translation
    - Computational Models
    - Cyber Security
    - Data Harmonization
    - Data Mining

- Deep Learning
- Feature Extraction
- Imaging Metrology and Standards
- Machine Learning
- Quantitative Image Analysis (CAD, Computerized Assessment of Prognosis, etc.)
- Robustness and Variability
- Statistical Models and Methods
- Treatment Response