- **Educational**
  - Innovation in Medical Physics Education
- **Professional**
  - Professional Practice of Medical Physics
  - Education (Clinical)
  - Legislation and Regulation
  - Administration and Management
  - Compliance and Quality Management
- **Scientific**
  - Imaging Physics
    - Radiography/Fluoroscopy
      - Dual-energy Imaging
      - Acquisition Imaging Physics and Novel Systems
      - Image Quality - Measurement & Modeling
      - Image Processing/Analysis/Segmentation/Registration/CAD
      - Clinical Applications
      - Dosimetry and Safety
      - Calibration and QA/QC
      - Quantitative Imaging
      - Virtual Tools and Phantoms
      - Radiomics / Imaging Genomics
    - Multi-detector CT
      - Dual-energy or Multi-energy CT
      - Acquisition Imaging Physics and Novel Systems
      - Reconstruction
      - Image Quality - Measurement, Modeling, and Artifacts corrections
      - Image Processing/Analysis/Segmentation/Registration/CAD
      - Clinical Applications
      - Dosimetry
      - Radiation dose reduction
      - Protocol Management/Optimization
      - Calibration and QA/QC
      - Quantitative Imaging
      - Dynamic imaging (Time-resolved/4D imaging)
      - Virtual Tools and Phantoms
      - Radiomics / Imaging Genomics
    - Cone-beam CT
      - Dual-energy or Multi-energy imaging
      - Acquisition Imaging Physics and Novel Systems
      - Reconstruction
      - Image Quality - Measurement, Modeling, and Artifacts corrections
      - Image Processing/Analysis/Segmentation/Registration/CAD
      - Clinical Applications
      - Dental Imaging
      - Breast Imaging
      - Dosimetry
      - Calibration and QA/QC
      - Quantitative Imaging
      - Dynamic imaging (Time-resolved/4D imaging)
      - Virtual Tools and Phantoms
      - Radiomics / Imaging Genomics
      - Protocol Management/Optimization

- Mammography/Tomosynthesis
    - Dual-energy or Multi-energy Imaging
    - Acquisition Imaging Physics and Novel Systems
    - Reconstruction
    - Image Quality - Measurement & Modeling & Artifacts correction
    - Virtual Tools and Phantoms
    - Image Processing/Analysis/Segmentation/Registration/CAD
    - Clinical Applications
    - Dosimetry
    - Calibration and QA/QC
    - Quantitative Imaging
    - Time-resolved mammography/breast tomosynthesis
    - Radiomics / Imaging Genomics
- Nuclear Medicine, PET and PET/MR
    - Acquisition Imaging Physics and Novel Systems
    - Attenuation Correction and Reconstruction
    - Image Quality - Measurement & Modeling & Artifacts correction
    - Image Processing/Analysis/Segmentation/Registration/CAD
    - Clinical Applications
    - Dosimetry
    - Calibration and QA/QC
    - Quantitative Imaging
    - Dynamic Imaging (Time-resolved/4D PET/SPECT/PET-MR)
    - Virtual Tools and Phantoms
    - Radiomics / Imaging Genomics
- MRI
    - Acquisition Imaging Physics and Novel Systems
    - Reconstruction
    - Image Quality - Measurement & Modeling & Artifacts corrections
    - Image Processing/Analysis/Segmentation/Registration/CAD
    - Clinical Applications
    - Safety
    - Calibration and QA/QC
    - Quantitative Imaging
    - Dynamic imaging (Time-resolved/4D imaging)
    - Virtual Tools and Phantoms
    - Radiomics / Imaging Genomics
- Pre-Clinical (Small Animal) Imaging Systems
    - Small-Animal Therapy-related Systems (Please submit under Therapy Track)
    - CT
    - MRI
    - CBCT
    - Nuclear Medicine, PET and PET/MR
    - Multi-modality
    - New and Emerging Modalities
    - Optical
    - Virtual Tools and Phantoms
- Optical
    - Acquisition Imaging Physics and Novel Systems
    - Reconstruction
    - Image Quality - Measurement & Modeling & Artifacts correction
    - Image Processing/Analysis/Segmentation/Registration/CAD
    - Clinical Applications
    - Calibration and QA/QC
    - Quantitative Imaging
    - Virtual Tools and Phantoms
    - Radiomics / Imaging Genomics
- New and Emerging Technology
    - X-Ray Phase-Contrast Imaging
    - X-Ray Fluorescence Imaging

        - X-ray imaging with distributed sources
        - Clinical Applications
        - Quantitative Imaging
        - Virtual tools and phantoms
        - Novel Contrast Agents and Nanoparticles for Imaging
        - Radiomics / Imaging Genomics
    - Multi-Modality Imaging
        - Acquisition Image Physics and Novel Systems
        - Reconstruction
        - Dosimetry
        - Image Quality - Measurement & Modeling & Artifacts correction
        - Image Processing/Analysis/Segmentation/Registration/CAD
        - Clinical Applications
        - Calibration and QA/QC
        - Quantitative Imaging
        - Virtual Tools and Phantoms
        - Radiomics / Imaging Genomics
    - MedPhys3.0

- **Multi-Disciplinary**
    - Imaging in Treatment Planning, Image Guidance, and Adaptive Radiation Therapy
        - CT (including CT simulation)
        - MRI
        - 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
    - 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
    - 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)
    - 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
        - Residual Range Detection

- 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
    - Radiomics / Imaging Genomics (Please submit under Imaging Track)
- Science Council Session - Data-Driven Automation and Decision Making
    - Data-Driven Automation
    - Data-Driven Decision Making
- Data Science/Radiomics/Computing
    - Quantitative Image Analysis (CAD, Computerized Assessment of Prognosis, etc.)
    - Autosegmentation
    - Treatment Response
    - Robustness and Variability
    - Association with Genomics
    - Clinical Translation
    - Data Mining
    - Deep Learning
    - Feature Extraction
    - Data Harmonization
    - Statistical Models and Methods
    - Computational Models
    - Imaging Metrology and Standards
    - Machine Learning
    - Cyber Security
- Quantitative Imaging
    - QI Phantoms - Physical or Synthetic (Digital Reference Object)
    - QI Data Acqusition Strategies
    - QI Phantoms
    - QI Data Acquisition Strategies
    - 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
- Ultrasound Imaging
    - Acquisition Image Physics and Novel Systems
    - Image Quality - Measurement & Modeling
    - Image processing/analysis/segmentation/registration/CAD
    - Photo-Acoustic Ultrasound
    - Calibration, QA/QC, and Safety
    - Image Registration for Diagnostic Radiology
    - Emerging Ultrasound Imaging Technnology
    - Preclinical/Small Animal
    - Contrast Agents
    - Ultrasound Imaging of Therapy Response
    - Molecular Imaging
    - Quantitative Imaging
    - Ultrasound Elastography
    - Clinical Applications
- MedPhys3.0

- **Therapy Physics**
    - 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
    - Immobilization Technology
        - External Immobilization Methods
        - Internal Immobilization Methods (balloon etc.)
        - 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
    - Brachytherapy and Radiopharmaceuticals
        - HDR Techniques
        - LDR Techniques
        - Planning and Dose Calculation
        - Biological Modeling
        - Brachytherapy QA
    - 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
    - Outcome Modeling and Assessment
        - Imaging for Therapy Assessment (Please submit under Multi-Disciplinary Track)

    - Late Effects
    - Early Effects
- 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)
- 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
- Radiation Protection and Shielding
    - Brachytherapy
    - Photon Therapy
    - Particle Therapy
- Targeted Radionuclide Therapies
    - Novel Radionuclide Therapies
    - Image Guidance (Please submit under Multi-Disciplinary Track)
- MedPhys3.0
- Ultrasound in Radiation Therapy
    - Quality Assurance
    - Robotic US Guidance
    - US guidance in Brachytherapy
    - Monitoring of Therapy
    - Motion Tracking
    - Image Registration with US for Patient Positioning
    - Ultrasound Imaging of Therapy Response
    - Ultrasound Treatment Planning
- Therapeutic Ultrasound
    - High-Intenstiy Therapetic 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