

## 4D Treatment Workshop for Particle Therapy

■ Dates: 7-8 of December 2018  
 ■ Venue: Executive Conference Room  
 The Alumni Hall "Frate"  
 Hokkaido University, JAPAN

### 【Day 1】

Time		Topic	Title	Speaker
10:00	Welcome			Hiroki Shirato (Hokkaido University)
10:30-12:00	1. Session	clinical practice (state of the art photons & protons therapy)	Overview about clinical indications of moving targets - state of the art photon and proton treatment (35min+10min)	Shinichi Shimizu (Hokkaido University)
			State of the art for moving targets treated in proton therapy (35min+10min)	Zhongxing Liao (MD Anderson Cancer Center)
12:00-13:30 Lunch				
13:30-16:00	2. Session	4D treatment planning	4D strategies - proton specific margins, scan path optimization, spot size optimization, spot weight optimization, beam angle optimization, number of field optimization - what is worth further investigation? (35min+10min)	Tony Lomax (Paul Scherrer Institute)
			4D robust optimization - the perfect solution or a unfavorable compromise? (Tentative) (35min+10min)	Annie Hsu (Stanford University)
			4D adapted treatment approaches - weekly adaptation, plan of the day, real-time tracking - what is clinical feasible? (35min+10min)	Paul Keall (Sydney Medical School)
16:00-17:00	A. Site Tour	Hokkaido University Proton Beam Therapy Center	Treatment room/Accerarate room tour Demonstration of beam delivery to moving phantom.	
17:00-18:30	Poster Sessions			
19:30 Dinner				

### 【Day 2】

Time		Topic	Title	Speaker
8:30-10:45	3. Session	4D imaging	In-room 4DCT, 4DCBCT, fluroscopy, Calypso (35min+10min)	Shinichiro Mori (National Institute of Radiology Science)
			Surface imaging and internal imaging - what are they worth? (35min+10min)	Naoki Miyamoto (Hokkaido University)
			4D MR imaging (from off-line towards online - what are the challenges/promises? (35min+10min)	Bas Raaymakers (University Medical Center Utrecht)
10:45-11:00 Coffee break				
11:00-12:30	4. Session	4D dosimetry	4D phantoms - what is available / what still needs to be developed? (35min+10min)	Yoshikazu Tsunashima (Saga HIMAT)
			Patient specific QA for mobile indications - the value of log-files (35min+10min)	Antje Knopf (University of Groningen)
12:30-13:30 Lunch				
13:30 - 15:00	5. Session	new impulses for 4D proton treatments	Personalized deep learning - Real-time projected-CTV contouring in X-ray fluoroscopy (35min+10min)	Toshiyuki Terunuma (University of Tsukuba)
			How could artificial intelligence, deep learning or neurol networks help us? (35min+10min)	Nikos Paragios (Ecole Centrale Paris)
15:00 - 15:30	Summary	highlights / report / list of definitions/ location & focus next year		Antje Knopf / Shinichi Shimizu