



## 4th European Doctoral School on Metamaterials

### Complex Material Effects in Electromagnetics

Rovaniemi, Finlande, August 21-23, 2006

#### Program:

#### *Monday 21*

Hour	Topic	Lecturer
09:00 - 10:00	Basics, Maxwell equations, constitutive relations, Complex material responses.	A. Sihvola
10:00 - 12:00	Effective medium modeling, Polarizability and single-particle response, Maxwell Garnett homogenization, Bruggeman homogenization.	A. Sihvola
12:00 - 13:00	Lunch	
13:00 - 15:00	Dispersion: Constitutive relations in time domain, Causality and Kramers Kronig conditions, Basic dispersion models	A. Sihvola
15:00 - 17:00	Self-study	

#### *Tuesday 22*

Hour	Topic	Lecturer
09:00 - 11:00	Wire media: Electromagnetic properties of wire lattices, Circuit model, Drude behaviour, spatial dispersion Split rings: Response of rings, Circuit model, Lorentz behaviour	S. Tretyakov
11:00 - 12:00	Workshop (student presentations)	
12:00 - 13:00	Lunch	
13:00 - 15:00	DNG metamaterials: Negative parameters, Limitations, Plane waves in DNG media, Negative refraction, surface plasmons	S. Tretyakov
15:00 - 17:00	Self-study	

#### *Wednesday 23*

Hour	Topic	Lecturer
09:00 - 10:00	Applications: Perfect lens, Review of other applications	S. Tretyakov
10:00 - 12:00	Workshop (student presentations)	
12:00 - 13:00	Lunch	
13:00 - 17:00	Excursion, social program	