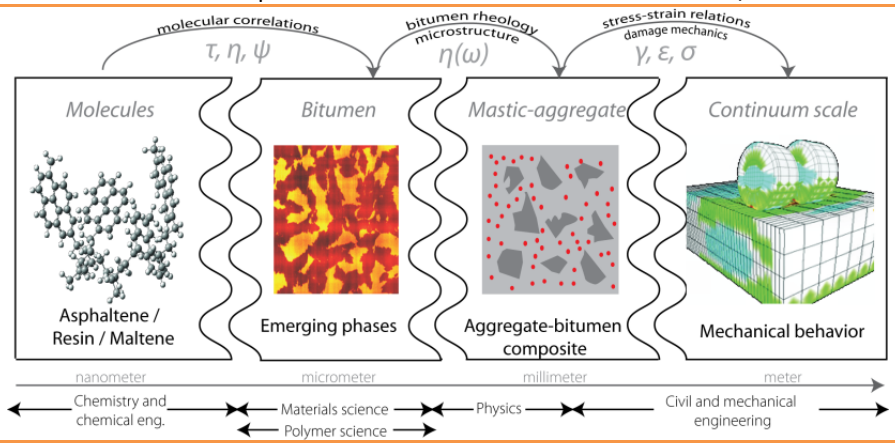
Project title:	**Healing in bituminous materials by phase segregation at (crack)surfaces'**
Projectnummer:	InfraQuest-2011-065
Start date:	1 June 2011 **End date:** 31 May 2015
Project team:	Sayeda Nahar (TU Delft), Alexander Schmets (TU Delft), Tom Scarpas (TU Delft), Hilde Soenen (Nynas, Belgium), Russell Varley (CSIRO, Australia), Steph Bredenhann (Goba,South Africa), Georg Schitter (TU Wien, Austria), Kraton and BAS BV.
Embedding in IQ-programme:	The PhD-project relates to the Masterplan 'Roads' (service-life aspects), and 'Materials' (Innovative materials & techniques for management and maintenance). Further the project relates to the IQ-project 'Pragmatische Healing' (IQ-2010-07), 'Vergelijkend AFM Onderzoek TNO-TU Delft Microstructuur van bitumen in relatie tot healing' (IQ-2011-059), the TNO KIP-project FCAM, and the TU Delft PhD-project 'Chemomechanics of Fracture, Self-Healing and Aging in Asphalt' (Troy Pauli).
Type of Project:	X Fundamental concept ☐ Integration & development ☐ Validation of results ☐ Product-in-context / valorisation
Graphical abstract:	
Research questions:	• The chemo-physical origin of the typical phase behaviour at micrometer shall be understood (which chemical component(s) of bitumen drive the process); • Understand the microscopic origin of the observed healing behaviour in bituminous materials from the mesoscopic level observed microstructural behavior; • Identification and testing of the entropic aggregation processes in bitumen; • Engineering and testing of the entropic aggregation processes in bitumen; • Employing advanced physical measurement methodologies to obtain new quantitative information on bituminous materials; • Exploit the improved understanding of healing at the meso-level for design strategies at the engineering level.
Conclusions:	The project will lead to a better (thermodynamic) understanding of the (already present) healing capacity of bituminous materials, on basis of which recommendations for optimization of the effect and its use in the engineering practice can be made.
Other results:	As a spin-off of the project we'll have developed an AFM system that is optimized for imaging rate-processes in soft condensed matter systems. Future projects in the field would certainly benefit from this.
Dissemination:	The research will lead to a PhD-thesis, publications in peer reviewed scientific journals, conference presentations and professional publications. Development of new characterization techniques may lead to IP or other technical developments that may help to startup new business ventures.