POLYMAT
Basque Center for
Macromolecular Design and Engineering

PhD Fellowships

2 PhD positions are available at the Basque Center for Macromolecular Design and Engineering, POLYMAT Fundazioa (www.polymat.eu) in projects funding by the consortium of companies forming the Industrial Liaison Program of POLYMAT.

PhD project 1. Influence of Particle Morphology on Film Cracking
This project deals with the challenging topic of high performance low VOC coatings. The economic importance of coatings is amazing: corrosion costs represent about 2-3% of the World's gross domestic product. Environmental concerns are pushing producers to waterborne coatings that face the challenge of achieving excellent film formation and high coating hardness without using environmentally unfriendly coalescing agents. The answer is multiphase particles that combine soft and hard domains. The soft polymer helps during film formation while the hard polymer stiffens the final coating. However, experience shows that cracks frequently appear due to internal film stresses appearing during film formation. This project aims at achieving a quantitative understanding the effect of particle morphology on the internal film stresses and to develop measures to avoid stress relieve by crack formation.

Applicants for this PhD project must have a solid background in Material Science and (by the time of the beginning the work) a Master in Material Science/Engineering, Chemistry, Chemical Engineering or any other related area.

PhD Project 2. Inter-particle cross-linking reactions in waterborne coatings.
High performance coatings can be produced by 2-component systems, typically one of them a dispersion containing OH groups and the second one being an isocyanate terminated oligomer. However, due to concerns with CLP regulation and REACH, low molecular weight cross-linkers are under scrutiny and an alternative is substitute the oligomer by a dispersion, changing the co-reactive functionalities. However with two different types of polymer dispersions, a number of phenomena may occurs during the drying process of the film (phase separation or stratification, poor coalescence because of difference in solubility parameter, etc) that can lead to inhomogeneous films where the co-reactive groups may not be able to react with each other. In this project aims at getting a better insight in the parameters that affect these processes leading to knowledge design such binder systems.

Applicants for this project must have a solid background and (by the time of the beginning the work) a Master in Chemistry, Chemical Engineering or any other related area.

Good command of written and spoken English is a must for both PhDs (if preselected, a telephone interview will be carried out before any other appointment is made). The selected candidates are expected to conduct research, write papers, and deliver a PhD thesis.

Applications should be addressed to Ms Idoia Azaldegui and sent via **email** in one single PDF to info@polymat.eu including:

(i) a cover letter highlighting their interest in the position.
(ii) curriculum vitae.
(iii) a short description of previous research (1-2 Pages).
(iv) the names and contact addresses (e-mail) of two academic referees.

Please note that because of the large number of applications expected, we will not be able to give individual feedback to unsuccessful applications.