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**Nano-composites obtained by phase separation of polymer blends close to and below  $T_g$**  GREGOIRE JULIEN, CNRS/Solvay — We propose a model for describing the dynamics in polymer blends close to and below  $T_g$ . The model is solved on a 2D lattice corresponding to spatial scales a few 100 nm and a resolution corresponding to the scale of dynamical heterogeneities. In the course of spinodal decomposition at low temperatures we observe slow structures building, which coexist with faster ones. Simultaneously, the distribution of relaxation times evolves toward longer times, corresponding to an ageing process. Domains are found to grow like the logarithm of the time. By tuning the physical parameters of the systems (polymer mass, polymer  $T_g$ 's and volume fraction) it should help making nano-composites with controlled morphologies on a scale typically of order 10 nm. We study also the melting dynamics of these systems, after the temperature is increased again in the totally miscible range.

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