



## Karlstad Applied Analysis Seminar (2023)

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### **Homogenisation of a system of Stokes flow and advection-reaction-diffusion transport in a porous medium with coupled evolving microstructure**

#### **Abstract**

We consider the homogenisation of the Stokes equations and an advection-reaction-diffusion equation in an porous medium with evolving microstructure. The microstructure's evolution is coupled with the unknown concentration of a substance, resulting in a free boundary value problem. We transform the problem into a fixed periodic domain, which results in a highly non-linear problem. By homogenising this substitute problem and transforming the limit problem back, we obtain as limit problem a Darcy law for evolving microstructure coupled with advective-reactive-transport.