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Section Computational Science,

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Expertise: The partner at the University of Amsterdam (JAK) has the know-how and expertise in computational biology. His research interests are: morphogenesis, marine sessile organisms, evolutionary processes, modelling and simulation of growth and form, self-organisation in complex systems. He is principal investigator in three research projects, funded by the Dutch Science Foundation, on systems biology, modelling metabolic pathways and regulatory networks, he is Co-PI in the “Mathematics and Computation for the System Biology of Cells” project (<http://www.science.uva.nl/research/scs/CellMath/>). He has an extensive experience in developing biomechanical models of morphogenesis of sponges and scleractinian corals (<http://www.science.uva.nl/research/scs/GF2004>). The Section Computational Science is one of the leading groups in the world in research on particle-based modelling techniques and large-scale computing techniques applied in computational biology. The Section Computational Science has access to large-scale computing and visualization facilities. JAK is member of the steering committee and work package (Biological Problem solving) leader of the EU funded project MORPHEX (morphogenesis and regulatory networks in plants and animals; NEST-2005-Path-com)

Curriculum vitae (J.A. Kaandorp). JAK received his MS, with distinction, in biology (main subject marine biology) in 1985 and a PhD (subject modelling growth and form of marine organisms) in computer science and mathematics in 1992, both from the University of Amsterdam. He has worked from 1985 -1987 as a researcher at the Centre of Computer Science and Mathematics in Amsterdam. In 1992 he did research as a postdoctoral fellow, on a Government of Canada Award, at the Department of Computer Science of the University of Calgary in Canada. Currently he works as an associate professor at the Section Computational Science of the Faculty of Mathematics, Computer Science, Physics & Astronomy of the University of Amsterdam.

Mentoring: J.A.K. lectures courses on Computational Biology, Scientific Computing and Scientific Visualization and is coordinator of the international Bioinformatics track with the Master Grid Computing at the University of Amsterdam. He has experience in supervision of students, both at undergraduate and post-graduate level. Available Graduation Projects in Computational Biology include, for example, Mathematics and Computation for the Systems Biology of Cells (modelling biochemical pathways, modelling genetic regulation in the cell), Modelling and simulation of developmental regulatory networks (inferring developmental regulatory networks from gene expression data, visualization of developmental regulatory networks), Modelling and simulation of growth and form (morphogenesis of sponges and corals, quantification of complex-shaped 3D morphologies, modelling reaction-advection-diffusion in 3D using the finite volume method).

Facilities: The group has access to an excellent local available distributed computing environment. For high performance computing we can use the Lisa cluster at the university of Amsterdam. Furthermore we expect that advanced visualisation will play an important role in this project. For the visual exploration and comparison to actual data sets, we are planning

to use the locally available visualisation equipment in the visualisation lab of the Section Computational Science. For the visual exploration and comparison to actual data sets, we are planning to use the locally available visualisation equipment, the PC based virtual reality environment using one projection screen (DRIVE) at the Section Computational Science and the Cave Automated Virtual Reality Environment at the Academic Computing Services of Amsterdam (SARA).