



From the School of Biomedical Sciences

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Dr Evgeni Nikolaev has asked me to provide a reference in support of his application for a post

Dr Nikolaev came to my attention through his publications on the analysis of periodic regimes in systems with symmetry, and I obtained funding for him to work for 18 months 1996–1997 on a mathematical project "Control of meandering spiral waves in excitable media as a basis for cardiac defibrillation," that also involved extensive reaction–diffusion PDE solutions in Cartesian, polar and spherical coordinates. This was carried out in my computational biology laboratory, in collaboration with Dwight Barkley at the Mathematics Institute, University of Warwick. At that time computational and experimental research had shown that re–entrant cardiac arrhythmias could be explained in terms of nonlinear wave dynamics, and idealised as spiral or scroll waves. Rigidly rotating spiral waves are periodic solutions of reaction diffusion equations that admit Euclidean symmetry, rotations and translations in the plane. Our goal to evaluate the role that symmetry could play in the transition from rigidly rotating spiral waves to meandering, and even drifting, spiral waves. Dr Nikolaev proposed a compact mathematical model to explain meander and drift phenomena, based on a regular theoretic approach developed in the theory of Hopf bifurcation with symmetry. While in my laboratory he also investigated computationally the resonant drift of spiral waves under repeated small amplitude perturbations.

Thus I know him as a knowledgeable and excellently trained mathematician, who is also computationally efficient and effective, and who can relate complicated phenomenology to simple and elegant underlying mathematics. He did no teaching in my laboratory, but was proactive in assisting some of my postgraduate students, by explaining the underlying mathematical basis, in a way understandable by biomedical scientists, and assisting with programming problems. I believe he would make a good and effective teacher, especially in a tutorial/small group context.

Since he left me he has been working on more commercially orientated, programming toolkits, in bioinformatics/engineering. I believe he would be more productive in a more conventional academic applied mathematics environment, and that, in addition to working collaboratively with other scientists as an applied mathematician, is fully capable of initiating and obtaining funding for novel mathematical projects.

Professor Arun V Holden
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A handwritten signature in black ink, appearing to read 'Arun V Holden'.