

Application for a:	Outgoing Scheme NEWFELPRO Fellowship for experienced researcher
Proposal Acronym:	AQCD
Proposal Title:	Quantum chromodynamics in accelerated frames
Research area(s):	Physics PHY
Research sub-disciplines:	Fundamental Constituents of Matter: Fundamental interactions and fields, Particle physics, Nuclear physics
Category of research:	basic
Duration in months:	36
Keywords:	quantum chromodynamics, extreme conditions, quark-gluon plasma, heavy ion collisions, acceleration, Unruh-Hawking effect, thermalization
Abstract:	<p>Quantum chromodynamics is a theory of interactions between the basic building blocks of matter: quarks and gluons. In nature quarks and gluons appear confined to the states known as hadrons. Given sufficient heat or compression, hadrons dissolve. Matter under such extreme conditions is prepared for a short time in heavy ion collisions at RHIC and LHC and is called the quark-gluon plasma. The plasma is not a static object, but in particular rapidly decelerates. We are interested in the early stages of the collision where the acceleration is strong enough to alter the vacuum structure of QCD. By formulating Quantum chromodynamics in accelerated frames we will be examining whether it is possible that the state of quasi-free quarks and gluons, where also chiral and axial baryon number symmetry is restored can be achieved for strong enough acceleration. This research will improve the understanding of the early time thermalization of the quark-gluon plasma.</p>
Does this proposal possess any of the sensitive ethical issues detailed in ethical issues table?	No