

Report on the PhD thesis of MSc Albina Serikbolova

As the foreign supervisor of the PhD student MSc Albina Serikbolova of the al-Farabi University, Kazakhstan, I would like to report on her PhD thesis **Branes and Monopoles in modified gravities and Yang-Mills theories**.

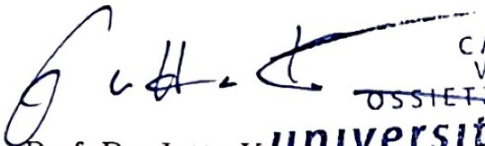
In her PhD thesis MSc Albina Serikbolova has provided an excellent introduction, showing her broad knowledge in the field of theoretical physics, where her thesis work has been embedded. She has well motivated her thesis work by explaining current open problems in cosmology, that are most simply addressed in the form of dark matter and dark energy, and she has nicely introduced alternative gravities in this context, since these theories might represent alternatives to explain these open problems.

She has then focused on the discussion of higher dimensional solutions and, in particular, branes as motivated by string theory, since her first publication has been on this subject. Here she has done original research by investigating the properties of D-branes in higher-dimensional alternative gravities, where she has constructed regular spherically symmetric solutions in vacuum, exploring the parameter space and presenting phase portraits.

The second topic of her original thesis work concerns magnetic monopoles and monopole-like solutions of Yang-Mills theories. Here she has addressed the famous problem of the mass gap. In order to tackle this problem, she has considered a spinor field coupled to an $SU(2)$ Yang-Mills field. When studying this highly complicated interacting system she has managed to construct localized solutions, that possess a mass gap and exhibit monopole-like features. Her interesting work has been published in two more papers.

In conclusion I would like to say, that MSc Albina Serikbolova has performed an impressive amount of difficult original research, that has been published in three well-known international journals. She has shown full

mastery of the field on the theoretical side, and she has performed numerous challenging numerical calculations. Therefore the thesis satisfies the highest requirements of doctoral dissertations. MSc Albina Serikbolova certainly deserves to be awarded the degree of Doctor of Philosophy (PhD) in the specialty 8D05306-Physics.


Prof. Dr. Jutta Kunz
CARL
VON
OSSJETZKY
universität
OLDENBURG
Fakultät V
Mathematik und Naturwissenschaften
Institut für Physik
Prof. Dr. Jutta Kunz-Drolshagen
D - 26111 Oldenburg

INSTITUT FÜR PHYSIK
AG FELDTHEORIE
Prof. Dr. Jutta Kunz

TELEFONDURCHWAHL
0441 798 – 3184
Sekretariat – 3071

FAX
0441 798 – 3080

EMAIL
jutta.kunz@uni-oldenburg.de

OLDENBURG

POSTANSCHRIFT
D-26111 Oldenburg
PAKETANSCHRIFT
Ammerländer Heerstraße 114 - 118
D-26129 Oldenburg
TELEFON
0441 798 - 0
INTERNET
www.uni-oldenburg.de

BANKVERBINDUNG
Landessparkasse zu Oldenburg
BLZ 280 501 00
Konto 1 988 112

BIC: SLZODE22
IBAN: DE46 2805 0100 0001 9881 12