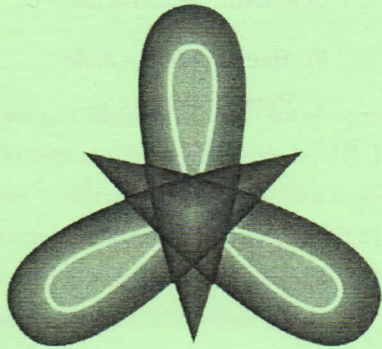


June 05-10, 2015 Varna, Bulgaria  
THE SEVENTEENTH INTERNATIONAL  
CONFERENCE ON

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# Geometry, Integrability and Quantization



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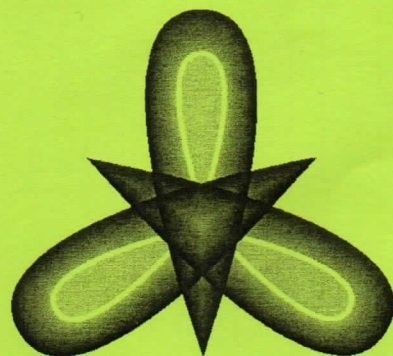
ABSTRACTS

June 05-10, 2015 Varna, Bulgaria

THE SEVENTEENTH INTERNATIONAL  
CONFERENCE ON

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Geometry,  
Integrability  
and  
Quantization



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PROGRAMME

**Seventeenth International Conference on Geometry, Integrability and Quantization  
June 5-10, 2015, Sts. Constantine and Elena**

**PROGRAMME**

	05 June	06 June	07 June	08 June	09 June	10 June
08:30-09:15	BREAKFAST		<b>EXCURSION</b>	BREAKFAST		
09:15-09:50	Gürses I	Gürses II		Gürses III	Gürses IV	Gürses V
09:50-10:10	Ungar	Kowalski		Ganchev	Kikuchi	Gerdjikov
10:10-10:30	Yoshioka	Roger		Kim	Arslan	Güler
10:30-11:00	COFFEE BREAK			COFFEE BREAK		
11:00-11:35	Vargas I	Sniatycki I		Sniatycki II	Vargas V	Sniatycki IV
11:35-11:55	Bejan	Ianovsky		Asadi	Dobrowolski	Hicdurmaz
11:55-12:15	Eken	Donchev		Toda	Gürler	Dimitric
12:30-13:30	LUNCH			LUNCH		
15:50-16:25	Vargas II	Vargas III		Vargas IV	Sniatycki III	Sniatycki V
16:25-16:45	Burinski	Jung		Milousheva	Özgür	Meneses
17:45-17:15	COFFEE BREAK			COFFEE BREAK		
17:15-17:50	Meng I	Meng II		Meng III	Meng IV	Meng V
17:50-18:10	Tek	Bulca		Güvenc	Turgay	Szancer
18:10-18:30	Fatholahi	Slawianowski		Yeğın	Golubovska	Kilicoglu
18:30-18:55	Aulisa	Cho	Kimura	Pulov	Yan	
19:00	DINNER					

We also derive the recursion operators and demonstrate their Hamiltonian hierarchies. Similar results can be derived also for affine algebras of higher rank.

## References

- [1] V. S. Gerdjikov, D. M. Mladenov, A. A. Stefanov, S. K. Varbev. Integrable equations and recursion operators related to the affine Lie algebras  $A_r^{(1)}$ .  
ArXiv: 1411.0273v1 [nlin-SI] JMP (In press)

## On Systems of Deformable Bodies with Internal Degrees of Freedom

Barbara Golubowska, Vasyl Kovalchuk and Ewa Eliza Rozko  
Institute of Fundamental Technological Research, Poland

We define Gauss map  $g$  of real hypersurface  $M$  in complex projective space to complex 2-plane Grassmannian. If  $M$  is Hopf, then  $g(M)$  is a totally complex submanifold with respect to Q.K. structure. Converse construction is given by using twistor fibration.

## Bour Surface Companions in Space Forms

Erhan Güler and Masashi Yasumoto  
Bartın University, Turkey

Minimal surfaces in Euclidean 3-space  $\mathbb{R}^3$  which are isometric to surfaces of revolution were first introduced by Edmond Bour, and they are explicitly described by the Weierstrass representation. Such minimal surfaces are called Bour's minimal surfaces. On the other hand, there are several Weierstrass-type representations for surfaces in other space forms. So it is natural to consider Bour-type surfaces in other 3-dimensional space forms.

In this talk, we present Bour-type surfaces in 3-dimensional space forms ( $\mathbb{R}^3$ , Minkowski 3-space  $\mathbb{R}^{2,1}$ , hyperbolic 3-space  $\mathbb{H}^3$  and de Sitter 3-space  $\mathbb{S}^{2,1}$ ). First we introduce the original Bour's minimal in  $\mathbb{R}^3$ , and using Weierstrass-type representations, we give explicit parametrizations for Bour-type surfaces in other 3-dimensional space forms. Finally, we introduce several properties of Bour-type surfaces.

## f-Biminimal Immersions

Fatma Gürler and Cihan Özgür

Balıkesir University, Turkey

In this study, via Euler-Lagrange equations, we introduce  $f$ -biminimal immersions. We obtain some results of  $f$ -biminimal curves in a Riemannian manifold. We also find some results of  $f$ -biminimal submanifolds in a Riemannian manifold of codimension 1. To obtain some examples of  $f$ -biminimal surfaces, we use Riemannian submersions. Finally we consider  $f$ -biminimal Legendre curves in Sasakian space forms and we obtain a non-trivial example.

## Toroidal Surfaces

Metin Gürses

Bilkent University, Turkey

We show that the 2-torus in  $\mathbb{R}^3$  is a critical point of a sequence of functionals  $\mathcal{F}_n$  ( $n = 1, 2, 3, \dots$ ) defined over compact 2-surfaces (closed membranes) in  $\mathbb{R}^3$ . When the Lagrange function  $\mathcal{E}$  is a polynomial of degree  $n$  of the mean curvature  $H$  of the surface, the radii  $(a, r)$  of the 2-torus are related as  $\frac{a^2}{r^2} = \frac{n^2-n}{n^2-n-1}$ ,  $n \geq 2$ . A simple generalization of 2-torus in  $\mathbb{R}^3$  is a tube of radius  $r$  along a curve  $\alpha$  which we call it toroidal surface (TS). We show that toroidal surfaces with non-circular curve  $\alpha$  do not provide minimal energy surfaces of the functionals  $\mathcal{F}_n$  ( $n = 2, 3$ ) on closed surfaces. We discuss possible applications of the functionals discussed in this work on cell membranes.

## Slant Curves in S-space Forms

Saban Güvenç and Cihan Özgür

Balıkesir University, Turkey

In this study, we define slant curves in S-space forms. We define slant curves to be biharmonic. We study biharmonic slant curves in S-space forms. In the final section, we find some

## Stability Analysis for Time-Dependent Differential Equations

Betul Hicdurmaz

Gebze Technical University, Turkey

The present talk gives the stability analysis of time-dependent differential equation. Additionally, applications of the stability analysis in an order.

## Some Aspects of the Spectral Theory of the Laplacian with $\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2$ Boundary Conditions in General Position

Alexandar Ianovsky

University of Cape Town, South Africa

We consider some aspects of the spectral theory of the Laplacian on a domain with  $\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2$  boundary conditions but involving rational dependence on the boundary conditions. In the question of the existence of analytic continuation of the spectral zeta function, we consider

# PROGRAMME

10 June, 2015

08:00 - 09:15 Breakfast

## Morning Session

Chairman: Cornelia-Livia Bejan

- 09:15 - 09:50 Metin Gürses  
Integrable Curves and Surfaces V
- 09:50 - 10:10 Vladimir S. Gerdjikov  
Systems of MKdV Equations Related to the Affine Lie Algebras
- 10:10 - 10:30 Erhan Güler  
Bour Surface Companions in Space Forms
- 10:30 - 11:00 Coffee
- 11:00 - 11:35 Jędrzej Śniatycki  
Lectures on Geometric Quantization IV
- 11:35 - 11:55 Betül Hıçdurmaz  
Stability Analysis for Time Fractional Schrödinger  
Differential Equations
- 11:55 - 12:15 Ivko Dimitric  
A Study of Low-Type Submanifolds in Complex  
Projective and Hyperbolic Spaces
- 12:30 - 14:00 Lunch

## Afternoon Session

Chairman: Metin Gürses

- 15:50 - 16:25 Jędrzej Śniatycki  
Lectures on Geometric Quantization V
- 16:25 - 16:45 Claudio Meneses-Torres  
The Kepler and Harmonic Oscillator Problems on  
Families of Coadjoint Orbits
- 16:45 - 17:15 Coffee
- 17:15 - 17:50 Guowu Meng  
Kepler Problem and Formally Real Jordan Algebras V
- 17:50 - 18:10 Zuzanna Szancer  
J-Tangent Affine Hyperspheres
- 18:10 - 18:30 Seyda Kılıçoğlu  
Some Results on Frenet Ruled Surfaces Along  
the Evolute-Involute Curves, in  $E^4$
- 18:30 - 18:50 Min Yan  
Painlevé Test and the Resolution of Singularities  
for Integrable Equations
- 18:30 - 20:00 Dinner



INTERNATIONAL CONFERENCE  
**Geometry, Integrability and Quantization**

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April 22, 2015

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Dear Dr Erhan Güler,

On behalf of the Organizing Committee I have the pleasure to invite you to take part in the Seventeenth International Conference on

Geometry, Integrability and Quantization

which is going to take place in June 4–11, 2015 at Sts. Constantine and Elena resort (near Varna), Bulgaria. For more details – see the content of the attached announcement or open the conference web page:

<http://obzor.bio21.bas.bg/conference>.

Let me inform you that the talk you have proposed within the area of your current research activities and entitled

*Bour Surface Companions in Space Forms*

is accepted for presentation and we will be delighted if you would be able to deliver a lecture (about 30–45 min) on its subject.

With kind regards and hoping that you will be able to take part in our Conference, I remain,

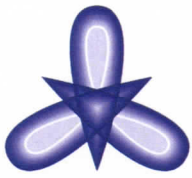
Sincerely yours,

*Ivailo M. Mladenov*

Ivailo M. Mladenov

Biographical information:

[http://www.bio21.bas.bg/ibf/dpb\\_files/Mladenov.htm](http://www.bio21.bas.bg/ibf/dpb_files/Mladenov.htm)



INTERNATIONAL CONFERENCE  
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To Whom it May Concern

This is to acknowledge receipt for the amount of 540 € from Erhan Güler, who delivered a talk on:

**Bour Surface Companions in Space Forms**

The receipt is for room, board and registration fee for his participation in the Seventeenth International Conference on Geometry, Integrability and Quantization, June 5-10, 2015 held in Sts. Constantine and Elena, Bulgaria.

On behalf of organizers:

*Ivailo M. Mladenov*