

**Isaac Newton Institute for Mathematical Sciences**

# **Closing Conference**

27 June - 1 July 2011

**Workshop Organisers:** Professor PE Newstead (Chair) (*Liverpool*), Professor L Brambila-Paz (*CIMAT, Mexico*), Professor O García-Prada (*CSIC, Madrid*) and Professor R Thomas (*Imperial*)

in association with the Newton Institute programme

**Moduli Spaces** (4 January to 1 July 2011)

## Scientific report

The workshop was the closing conference of the semester on Moduli Spaces taking place at the Isaac Newton Institute for Mathematical Sciences in Cambridge from 4 January to 1 July 2011, organized by P Newstead (Liverpool), L Brambila-Paz (CIMAT, Mexico), O Garcia-Prada (CSIC, Spain) and R Thomas (Imperial College London). The meeting also constituted the 2011 workshop of the international research group Vector Bundles on Algebraic Curves.

The workshop consisted of 13 invited talks by experts and 9 contributed talks, mostly by younger participants and all of a very high standard. Many aspects of moduli spaces were discussed, including those which formed the backbone of the programme. There were four talks with “Higgs” in the title and several others concerned with the topology of moduli spaces and representations. Manton's talk on vortices on Riemann surfaces also links with ITGP, as do the talks on derived categories and stability conditions. There were also two talks on Brill-Noether theory for vector bundles, a topic that has been given renewed interest through its connections with moduli spaces of curves. One should also mention a very interesting talk by Donaldson on Kähler-Einstein metrics and geometric invariant theory.

In addition to the talks, there was a lot of interaction and discussion among the participants, who included many research students and postdoctoral researchers. The meeting formed a fitting closure to a successful programme.

Our thanks are due to the staff of the Isaac Newton Institute, who contributed so much to the success of the workshop and the programme as a whole.

## MOSW04 Moduli Spaces: Closing Conference

### Financial Report

Name	Subs	Sponsor	Travel	Sponsor	Comments
Abdellaoui, G	£745.00	ITGP	£157.33	ITGP	
Bolognesi, M	£100.00	ITGP			Speaker
Boysal, A	£540.00	ITGP			
Callander, B	£540.00	ITGP	£122.77	ITGP	
Casimiro, AC			£210.59	ITGP	
Fernández Álvarez, D	£585.00	ITGP			
Garcia-Fernandez, M	£540.00	ITGP			
Logares, M			£123.90	ITGP	Speaker
Macias Marques, P	£540.00	ITGP	£233.85	ITGP	
Mandini, A			£223.40	ITGP	Speaker
Martens, J	£580.00	ITGP			Speaker
Newstead, P			£75.21	ITGP	Organiser
Ngo Dac,	£540.00	ITGP			
Peón Nieto, A	£540.00	ITGP	£340.00	ITGP	
Pons Llopis, JF	£540.00	ITGP	£291.72	ITGP	
Rayan, S	£50.00	ITGP	£40.00	ITGP	
Rubio, R	£580.00	ITGP			Speaker
Schaposnik Massolo, LP	£745.00	ITGP			
Schlueter, DC	£50.00	ITGP	£138.60	ITGP	
Yazdanpanah, V	£540.00	ITGP			
Zamora Saiz, A	£580.00	ITGP	£131.10	ITGP	
	<b>£8,335.00</b>		<b>£2,088.47</b>		
<b>Total ITGP</b>	<b>£10,423.47</b>	<b>€ 11,986.99</b>			
Hsiao, YN	£745.00	LEVERHULME			
Jung, S-J	£540.00	LMS			
Gasparim, E	£540.00	SCOTTISH			
Beauville, A	£670.00	INI WORKSHOP			
Ben-Bassat, O	£465.00	INI WORKSHOP	£352.92	INI WORKSHOP	
Berczi, G	£465.00	INI WORKSHOP			
Brundu, M	£465.00	INI WORKSHOP	£125.10	INI WORKSHOP	
Calderbank, DMJ	£465.00	INI WORKSHOP			
Casimiro, AC	£465.00	INI WORKSHOP			
Dey, A	£465.00	INI WORKSHOP			
Donaldson, S	£100.00	INI WORKSHOP			Speaker
Dunajski, M	£100.00	INI WORKSHOP			
Goettsche, L	£670.00	INI WORKSHOP			Speaker
Goldman, WM	£670.00	INI WORKSHOP			Speaker
Hausel, T	£670.00	INI WORKSHOP			Speaker
Hernandez Ruiperez, D	£745.00	INI WORKSHOP			
Hitchin, N	£325.00	INI WORKSHOP			Speaker
Huh, S	£465.00	INI WORKSHOP			
Hyeon, D	£465.00	INI WORKSHOP	£900.00	INI WORKSHOP	
Iena, O	£465.00	INI WORKSHOP			Speaker
Khalid, M	£465.00	INI WORKSHOP			Speaker
Lange, H	£670.00	INI WORKSHOP			
Lopez Martin, A	£465.00	INI WORKSHOP	£231.13	INI WORKSHOP	
Mandini, A	£465.00	INI WORKSHOP	£223.40	INI WORKSHOP	Speaker
Mundet i Riera, I	£465.00	INI WORKSHOP			
Reid, M	£100.00	INI WORKSHOP	£50.00	INI WORKSHOP	
Sánchez-Gómez, D	£500.00	INI WORKSHOP			
Shen, M	£100.00	INI WORKSHOP			
Soares, H	£670.00	INI WORKSHOP	£204.35	INI WORKSHOP	
Szenes, A	£670.00	INI WORKSHOP			
Teixidor i Bigas, M	£670.00	INI WORKSHOP			Speaker
Tejero Prieto, C	£465.00	INI WORKSHOP	£146.74	INI WORKSHOP	
Wilkin, G	£1,220.00	INI WORKSHOP			

Participants supported from their own funds or from Isaac Institute programme funds					
Álvarez-Cónsul, L					
Andreas, B					
Bayer, A					Speaker
Belkale, P					Speaker
Bertram, A					
Bhosle, UN					
Birkar, C					
Biswas, I					
Bottacin, F					
Bradlow, S					
Brambila-Paz, GL					Organiser
Bruzzo, U					
Bugajska, K					
Choi, S					
Fantechi, B					
Farkas, G					Speaker
Florentino, CAA					
Franco Gómez, E					
Gama Oliveira, A					
García-Prada, O					Organiser
Giansiracusa, JH					
Giansiracusa, N					
Grojnowski, I					
Grzegorzczuk, I					
Ho, NK					
Hurtubise, J					Speaker
Kim, JH					
King, A					
Kirwan, FC					Speaker
Kovalev, AG					
Lelli-Chiesa, M					
Logvinenko, T					
Machu, FX					
Maciocia, A					
Maican, M					Speaker
Manon, C					
Manton, N					Speaker
Meachan, C					
Meir Ben Efraim, E					
Mustata, AM					
Nakajima, H					
Narasimhan, MS					
Newstead, PE					Organiser
Oprea, D					
Ortega, A					
Ott, AMJ					
Ritter, A					
Ross, J					
Schaffhauser, FMR					Speaker
Schmitt, A					
Segal, EP					
Serman, O					
Shepherd-Barron, N					
Stoppa, J					
Thaddeus, M					
Thomas, RPW					Organiser
Toledo, D					
Tommasini, M					
Tong, D					
Totaro, BJ					
Vázquez-Gallo, M-J					
Wilson, P					
Yoshioka, K					Speaker

**Moduli Spaces: Closing conference**  
**27 June-1 July 2011**  
**Organiser: Peter Newstead**

Name	Home Institution	Nationality	Co of Res.	Sex	Age
Abdellaoui, G	SISSA	Algeria	Italy	F	28
Álvarez-Cónsul, L	ICMAT	Spain	Spain	M	41
Andreas, B	Freie Universität Berlin	Germany	Germany	M	41
Bayer, A	University of Connecticut	Germany	USA	M	35
Beauville, A	Université de Nice	France	France	M	64
Belkale, P	University of North Carolina	India	USA	M	38
Ben-Bassat, O	University of Haifa	USA	Israel	M	35
Berczi, G	University of Oxford	Hungary	United Kingdom	M	31
Bertram, A	University of Utah	USA	USA	M	49
Bhosle, UN	Tata Institute of Fundamental Research	India	India	F	62
Birkar, C	University of Cambridge	United Kingdom	United Kingdom	M	33
Biswas, I	Tata Institute of Fundamental Research	India	India	M	47
Bolognesi, M	Université de Rennes 1	Italy	France	M	32
Bottacin, F	Università degli Studi di Padova	Italy	Italy	M	47
Boysal, A	Bogaziçi Üniversitesi	Turkey	Turkey	F	39
Bradlow, S	University of Illinois at Urbana-Champaign	USA	USA	M	54
Brambila-Paz, GL	Centro de Investigación en Matemáticas	Mexico	Mexico	F	58
Brundu, M	Università degli Studi di Trieste	Italy	Italy	F	53
Bruzzo, U	SISSA	Italy	Italy	M	56
Bugajska, K	York University (Canada)	Canada	Canada	F	69
Calderbank, DMJ	University of Bath		United Kingdom	M	-
Callander, B	Universität Bonn	United Kingdom	Germany	M	25
Casimiro, AC	Universidade Nova de Lisboa (UNL)	Portugal	Portugal	F	35
Choi, S	Korea Advanced Institute of Science and Technology (KAIST)	Korea, Republic Of	Korea, Republic Of	M	48
Dey, A	Indian Institute of Technology	India	India	M	34
Donaldson, S	Imperial College London	United Kingdom	United Kingdom	M	54
Dunajski, M	University of Cambridge	Poland	United Kingdom	M	40
Fantechi, B	SISSA	Italy	Italy	F	45
Farkas, G	Humboldt-Universität zu Berlin	Romania	Germany	M	38
Fernández Álvarez, D	ICMAT	Spain	Spain	M	24
Florentino, CAA	Universidade Técnica de Lisboa	Portugal	Portugal	M	43
Franco Gómez, E	ICMAT	Spain	Spain	M	28
Gama Oliveira, A	University of Trás-os-Montes and Alto Douro	Portugal	Portugal	M	35
García-Fernandez, M	Aarhus Universitet	Spain	Denmark	M	29
García-Prada, O	Consejo Superior de Investigaciones Científicas	Spain	Spain	M	51
Gasparim, E	University of Edinburgh	Brazil	United Kingdom	F	48
Giansiracusa, JH	University of Bath	USA	United Kingdom	M	30
Giansiracusa, N	Brown University	USA	USA	M	27
Goettsche, L	Abdus Salam International Centre for Theoretical Physics (ICTP)	Germany	Italy	M	50
Goldman, WM	University of Maryland	USA	USA	M	56
Grojnowski, I	University of Cambridge	Australia	United Kingdom	M	45
Grzegorzczuk, I	California State University	USA	USA	F	52
Hausel, T	University of Oxford	Hungary	United Kingdom	M	39
Hernandez Ruiperez, D	Universidad de Salamanca	Spain	Spain	M	57
Hitchin, N	University of Oxford	United Kingdom	United Kingdom	M	65
Ho, NK	National Tsing Hua University	Canada	Taiwan	F	36
Hsiao, YN	Université de Genève	Taiwan	Switzerland	F	27
Huh, S	Sungkyunkwan University	Korea, Republic Of	Korea, Republic Of	M	33
Hurtubise, J	McGill University	Canada	Canada	M	54
Hyeon, D	POSTECH	USA	Korea, Republic Of	M	37
Iena, O	SISSA	Ukraine	Italy	M	29
Jung, S-J	University of Warwick	Korea, Republic Of	United Kingdom	M	28
Khalid, M	St. Patrick's College Drumcondra	Pakistan	Ireland	M	36
Kim, JH	Korea Advanced Institute of Science and Technology (KAIST)	Korea, Republic Of	Korea, Republic Of	M	44
King, A	University of Bath	United Kingdom	United Kingdom	M	49
Kirwan, FC	University of Oxford	United Kingdom	United Kingdom	F	52
Kovalev, AG	University of Cambridge	United Kingdom	United Kingdom	M	45

Lange, H	Universität Erlangen-Nürnberg	Germany	Germany	M	68
Lelli-Chiesa, M	Humboldt-Universität zu Berlin	Italy	Germany	F	25
Logares, M	ICMAT	Spain	Spain	F	35
Logvinenko, T	University of Warwick	United Kingdom	United Kingdom	M	34
Lopez Martin, A	Korea Institute for Advanced Study (KIAS)	Spain	Korea, Republic Of	M	30
Machu, FX	University of Alberta	France	Canada	M	34
Macias Marques, P	Universidade de Évora	Portugal	Portugal	M	36
Maciocia, A	University of Edinburgh	United Kingdom	United Kingdom	M	47
Maican, M	Institute of Mathematics of the Romanian Academy	Romania	Romania	M	35
Mandini, A	Universidade Técnica de Lisboa	Italy	Portugal	F	32
Manon, C	University of California, Berkeley	USA	USA	M	31
Manton, N	University of Cambridge		United Kingdom	M	-
Martens, J	Aarhus Universitet	Belgium	Denmark	M	34
Meachan, C	University of Edinburgh	United Kingdom	United Kingdom	M	26
Meir Ben Efraim, E	Technion - Israel Institute of Technology	Israel	Israel	M	26
Mundet i Riera, I	Universitat de Barcelona	Spain	Spain	M	38
Mustata, AM	University College Cork	Romania	Ireland	F	38
Nakajima, H	Kyoto University	Japan	Japan	M	49
Narasimhan, MS	Ramanujan Mathematical Society	India	India	M	79
Newstead, PE	University of Liverpool	United Kingdom	United Kingdom	M	70
Ngo Dac,	Université Paris 13 Nord	Viet Nam	France	M	32
Oprea, D	University of California, San Diego	Romania	USA	M	34
Ortega, A	Humboldt-Universität zu Berlin	Mexico	Germany	F	36
Ott, AMJ	IHES	Germany	France	M	32
Peón Nieto, A	Consejo Superior de Investigaciones Científicas	Spain	Spain	F	28
Pons Llopis, JF	Universitat de Barcelona	Spain	Spain	M	34
Rayan, S	University of Oxford	Canada	United Kingdom	M	28
Reid, M	University of Warwick	United Kingdom	United Kingdom	M	63
Ritter, A	University of Cambridge	Germany	United Kingdom	M	30
Ross, J	University of Cambridge	United Kingdom	United Kingdom	F	33
Rubio, R	University of Oxford	Spain	United Kingdom	M	29
Sánchez-Gómez, D	Universidad de Salamanca	Spain	Spain	M	33
Schaffhauser, FMR	Universidad de los Andes	France	Colombia	M	32
Schaposnik Massolo, LP	University of Oxford	Argentina	United Kingdom	F	26
Schlueter, DC	University of Oxford	Germany	United Kingdom	M	28
Schmitt, A	Freie Universität Berlin	Germany	Germany	M	42
Segal, EP	Imperial College London	United Kingdom	United Kingdom	M	29
Serman, O	Université des Sciences et Technologies de Lille	France	France	M	30
Shen, M	University of Cambridge	China	United Kingdom	M	29
Shepherd-Barron, N	University of Cambridge	United Kingdom	United Kingdom	M	56
Soares, H	Instituto Universitário de Lisboa (ISCTE)	Portugal	Portugal	F	36
Stoppa, J	University of Cambridge	Italy	United Kingdom	M	30
Szenes, A	Université de Genève	Hungary	Switzerland	M	46
Teixidor i Bigas, M	Tufts University	Spain	USA	F	53
Tejero Prieto, C	Universidad de Salamanca	Spain	Spain	M	42
Thaddeus, M	Columbia University	USA	USA	M	44
Thomas, RPW	Imperial College London	United Kingdom	United Kingdom	M	39
Toledo, D	University of Utah	USA	USA	M	66
Tommasini, M	SISSA	Italy	Italy	M	26
Tong, D	University of Cambridge	United Kingdom	United Kingdom	M	38
Totaro, BJ	University of Cambridge	USA	United Kingdom	M	44
Vázquez-Gallo, M-J	Universidad Politécnica de Madrid	Spain	Spain	F	44
Wilkin, G	University of Colorado	Australia	USA	M	36
Wilson, P	University of Cambridge	United Kingdom	United Kingdom	M	59
Yazdanpanah, V	University College Cork	Iran	Ireland	M	30
Yoshioka, K	Kobe University	Japan	Japan	M	45
Zamora Saiz, A	ICMAT-CSIC	Spain	Spain	M	26



Workshop Programme: **Closing conference**

27 June-1 July 2011

**Monday 27 June**

09:00-09:55 Registration and welcome

09:55-10:00 Opening remarks and welcome from Sir David Wallace (INI Director)

10:00-11:00 **Hausel, T** (*Oxford*)

[Arithmetic and physics of Higgs moduli spaces](#)

11:00-11:30 Morning coffee

11:30-12:30 **Kirwan, F** (*Oxford*)

[Hyperkahler implosion](#)

12:30-13:30 Lunch at Wolfson Court

14:00-14:30 **Mandini, A** (*Técnica de Lisboa*)

[Hyperpolygons and moduli spaces of parabolic Higgs bundles](#)

14:40-15:10 **Rubio, R** (*Oxford*)

[Higgs bundles and Hermitian symmetric spaces](#)

15:20-15:50 **Martens, J** (*Aarhus*)

[Compactifications of reductive groups as moduli stacks of bundles](#)

16:00-16:30 Afternoon Tea

16:30-17:30 **Goettsche, L** (*ICTP*)

[Refined curve counting on algebraic surfaces](#)

17:30-18:30 Welcome wine reception

18:45-19:30 Dinner at Wolfson Court (residents only)

**Tuesday 28 June**

10:00-11:00 **Belkale, P** (*North Carolina*)

[Geometric unitarity of the KZ/Hitchin connection on conformal blocks in genus 0](#)

11:00-11:30 Morning Coffee

11:30-12:30 **Teixidor i Bigas, M** (*Tufts*)

[Brill-Noether theory for vector bundles with fixed determinant](#)

12:30-13:30 Lunch at Wolfson Court

14:00-14:30	<b>Maican, M</b> ( <i>IMRA</i> ) Moduli of plane sheaves supported on curves of low multiplicity
14:40-15:10	<b>Schaffhauser, FMR</b> ( <i>Los Andes</i> ) Topology of moduli spaces of vector bundles on a real algebraic curve
15:20-15:50	<b>Iena, O</b> ( <i>SISSA</i> ) Universal plane curve and moduli spaces of 1-dimensional coherent sheaves
16:00-16:30	Afternoon Tea
16:30-17:30	<b>Farkas, G</b> ( <i>Humboldt</i> ) Rank two Brill-Noether theory and the birational geometry of the moduli space of curves
18:45-19:30	Dinner at Wolfson Court (residents only)
<b>Wednesday 29 June</b>	
10:00-11:00	<b>Manton, N</b> ( <i>Cambridge</i> ) Vortices on Riemann Surfaces
11:00-11:30	Morning Coffee
11:30-12:30	<b>Hurtubise, J</b> ( <i>McGill</i> ) Monopoles on the product of a surface and the circle
12:30-13:30	Lunch at Wolfson Court
13:30-17:30	Free time
19:30-22:00	Conference Dinner at Christ's College
<b>Thursday 30 June</b>	
10:00-11:00	<b>Donaldson, S</b> ( <i>Imperial</i> ) Kähler-Einstein metrics and Geometric Invariant Theory
11:00-11:30	Morning Coffee
11:30-12:30	<b>Bayer, A</b> ( <i>Connecticut</i> ) Stability conditions for the local projective plane
12:30-13:30	Lunch at Wolfson Court
14:00-14:30	<b>Bolognesi, M</b> ( <i>Rennes 1</i> ) Derived categories and rationality of conic bundles
14:40-15:10	<b>Khalid, M</b> ( <i>St. Patrick's College Drumcondra</i> ) Derived equivalences of Azumaya algebras on K3 surfaces
15:20-15:50	<b>Logares, M</b> ( <i>ICMAT</i> ) Deligne-Hodge polynomials for $SL(2, \mathbb{C})$ -character varieties of genus 1 and 2.



16:00-16:30	Afternoon Tea
16:30-17:30	<b>Yoshioka, K</b> ( <i>Kobe</i> ) <a href="#">Bridgeland stability conditions and Fourier-Mukai transforms</a>
18:45-19:30	Dinner at Wolfson Court (residents only)
<b>Friday 01 July</b>	
10:00-11:00	<b>Goldman, W</b> ( <i>Maryland</i> ) <a href="#">Moduli spaces of locally homogeneous geometric structures</a>
11:00-11:30	Morning Coffee
11:30-12:30	<b>Hitchin, NJ</b> ( <i>Oxford</i> ) <a href="#">Higgs bundles and quaternionic geometry</a>
12:30-13:30	Lunch at Wolfson Court
13:30-17:00	Free time
18:45-19:30	Dinner at Wolfson Court (residents only)