

# MAGIC Annual Report

---

*July 2013 – June 2014*

## Contents

1. Introduction.....	1
1.1. Membership .....	2
1.2. MAGIC Management Committee (2013-2014) .....	2
1.3. MAGIC Programme Committee (2013-2014).....	2
1.4. MAGIC Academic Steering Committee (2013-2014).....	2
1.5. Minutes.....	3
2. Progress and activities 2013-2014.....	3
2.1. MAGIC Administrator and Technical Support Posts.....	3
2.2. Video Conferencing Software Update.....	3
2.3. Website.....	3
2.4. Recording of lectures.....	3
2.5. Other activities and use of the MAGIC facilities.....	3
2.6. Technical problems and issues .....	4
3. Academic Aspects 2013-2014.....	4
3.1. Academic Programme 2013-2014 .....	4
3.2. Questionnaires and feedback.....	4
3.3. Assessment Policies.....	5
3.4. Registration data .....	5

## 1. Introduction

The MAGIC (Mathematics Access Grid Instruction and Collaboration) project is an EPSRC sponsored project which commenced in October 2006 and is aimed at sharing postgraduate lectures in mathematics for PhD students using Access-Grid technology. The consortium currently has 20 universities as partners with both small and large departments being fully involved in the delivery of the programme of lectures in addition to their students being able to fully participate in the lectures.

Earlier annual reports on MAGIC can be found at [http://www.maths-magic.ac.uk/annual\\_reports](http://www.maths-magic.ac.uk/annual_reports)

[The annual reports](#) give extensive detail on how the project has developed over the years and contain information on the suite of courses which MAGIC has delivered and some of the technical and other issues that MAGIC has encountered.

The current MAGIC website <http://www.maths-magic.ac.uk> contains last year's annual report, details of the current programme and the courses available.

## 1.1. Membership

**Table 1: A list of MAGIC Consortium Partners**

University of Birmingham	Loughborough University
Durham University	University of Manchester
University of Cardiff	University of Newcastle
University of East Anglia	University of Northumbria
University of Exeter	University of Nottingham
Keele University	University of Reading
University of Lancaster	University of Sheffield
University of Leeds	University of Southampton
University of Leicester	University of Surrey
University of Liverpool	University of York

A modified MAGIC Legal Agreement was signed in April 2014 to include the University of Northumbria as a new member of the consortium.

## 1.2. MAGIC Management Committee (2013-2014)

**Table 2: MAGIC Management Committee**

Prof. Jitesh S. B. Gajjar (University of Manchester)	Director of MAGIC
Prof. Peter Ashwin (Exeter University)	Deputy Director
Dr Giampaolo D'Alessandro (Southampton University)	
Prof. Alastair Rucklidge (University of Leeds)	
Dr Ian McIntosh (University of York)	Programme Committee Chair
Dr Martin Turner (University of Manchester)	
Professor Neil Strickland (Sheffield University)	
James Perrin	MAGIC Technical Officer
Julie Thompson / Sarah Insall	MAGIC Administrator

## 1.3. MAGIC Programme Committee (2013-2014)

**Table 3: Programme Committee**

Dr Ian McIntosh (University of York)	Chair of Programme Committee
Prof. Jitesh S. B. Gajjar (University of Manchester)	Ex Officio
Prof. Alexey Bolsinov (Loughborough University)	
Dr Gianne Derks (University of Surrey)	
Dr Tobias Kuna (University of Reading)	
Prof. Christopher Parker (University of Birmingham)	
Prof. Tim Phillips (Cardiff University)	
Prof. Mary Rees (University of Liverpool)	
Prof. Richard Tew (University of Nottingham)	

## 1.4. MAGIC Academic Steering Committee (2013-2014)

**Table 4: A list of members of the Academic Steering Committee**

Prof. Nigel Peake	Chair of Academic Steering Committee
Prof. Jitesh S. B. Gajjar (University of Manchester)	Director of MAGIC
Dr Ian McIntosh (University of York)	Chair of Programme Committee
Prof. Peter Ashwin (Exeter University)	
Dr Alexey Bolsinov (Loughborough University)	
Dr Giampaolo D'Alessandro (Southampton University)	
Dr Gianne Derks (University of Surrey)	
Prof. Yibin Fu (Keele University)	
Dr Kevin Houston (University of Leeds)	
Prof. Peter Jorgensen (Newcastle University)	
Dr Jonathan Kirby (University of East Anglia)	
Dr Tobias Kuna (University of Reading)	

Prof. Martin Lindsay (Lancaster University)	
Prof. Christopher Parker (University of Birmingham)	
Prof. Sergei Petrovskii (University of Leicester)	
Prof. Tim Phillips (Cardiff University)	
Prof. Mary Rees (University of Liverpool)	
Dr Dirk Scheutz (Durham University)	
Prof. Neil Strickland (University of Sheffield)	
Prof. Richard Tew (University of Nottingham)	
Dr. Sarah Lombardo (University of Northumbria)	

## 1.5. Minutes

The minutes of the meetings of the MAGIC MC, PC and ASC, together with the agenda papers can be found at: [https://maths-magic.ac.uk/admin/management/list\\_meetings.php](https://maths-magic.ac.uk/admin/management/list_meetings.php)

## 2. Progress and activities 2013-2014

### 2.1. MAGIC Administrator and Technical Support Posts

The MAGIC Administrator (0.5FTE) role was taken over by Sarah Insall from Julie Thompson in April 2014. Technical support is provided by the MAGIC Technical Support person (0.4FTE) James Perrin. Both are employed at the University of Manchester. Professor Peter Ashwin (Exeter) is now Deputy Director of MAGIC.

### 2.2. Video Conferencing Software Update

MAGIC's video conferencing platform had been provided by IOCOM's IG2 software, with JANET maintaining the service. Early in 2013 we were informed that the IG2 and its servers were at the end of life and would be replaced with IOCOM's Visimeet software. This meant that during the summer of 2013 all 18 sites were migrated to the new video conferencing platform. This was performed by local IT staff or the node representative following a MAGIC specific installation guide and online support by the Technical Support person. Training for staff was also provided via interactive sessions in September 2013 and January 2014.

The benefits of VISIMEET include a more robust and flexible service although some features such as video display layout have been removed. We are working with IOCOM to provide useful missing features that were used previously for multi-site video conferencing.

### 2.3. Website

The MAGIC website has been up and running without any significant issues over the last year, though a change in local policy at Manchester effected the sending of email from the website for several days during the first week of May. Most of the work on the website has been related to the change in video conferencing platform and to improve the internal auditing to make it easier for the programme committee to view how courses have performed over the years.

### 2.4. Recording of lectures

The change in video conferencing platform meant that recording of lectures was no longer possible with our existing software solution during 2013/14. Technical Support has been working with IOCOM to work out how to provide a solution to schedule, record and make available lectures. We plan to fulfil the first two tasks for the start of the 2014/15 session and work to have the lectures available at a later date.

### 2.5. Other activities and use of the MAGIC facilities

The 2013/14 MAGIC popular lecture was given on the 8th October 2013 by Prof. Jonathan Keating FRS on "Quantum Mechanics and Topology".

Exeter has been running a series of CliMathNet seminars on various topics:

- 12/07/13 – CliMathNet e-seminar: Inclusion of Linearized Moist Physics in NASA's Goddard Earth Observing System Data Assimilation Tools (Exeter)
- 16/07/13 – CliMathNet seminar: Multiscale Methods for the Multiscale Environment of Climate Simulation (Exeter)

Draft

- 22/10/13 – CliMathNet seminar: A Simple Conceptual Framework for Stratosphere Troposphere Coupling (Exeter)
  - 25/10/13 – CliMathNet seminar: Dew Droplets and Cloud Droplets - Droplet Growth, Size Distributions, and Corrections to Scaling
  - 14/11/13 – CliMathNet seminar: Spatial methods that combine ideas from wavelets and lattices (Exeter)
  - 25/03/14 – CliMathNet e-seminar: Accounting for model error due to unresolved scales within ensemble Kalman filtering (Peter Ashwin, \*External)
  - 29/04/14 – CliMathNet e-seminar: Hamilton's Principle for the GFD Model Hierarchy (Exeter)
  - 05/06/14 – CliMathNet Seminar: Statistical emulation as a model-coupling tool for integrated assessments of climate change (Neil Edwards, Open University)
- Also Leeds has been running a series of AG Dynamics seminars on various topics:
- 29/10/13 – Access Grid Dynamics Seminar:
  - 26/03/14 – Access Grid Dynamics Seminar: (Liverpool)
  - 09/06/14 – Access Grid Dynamics Seminar: Network Models of Visual Illusions and Rivalry (Ian Stewart, Warwick)

## 2.6. Technical problems and issues

There have been far fewer reported problems than last year, 9 compared to 26, and most of these related to an equipment failure at Loughborough that took some time to track down. Student feedback has suggested other unreported problems such as delayed lectures because of lack of familiarity with the desktop software.

## 3. Academic Aspects 2013-2014

### 3.1. Academic Programme 2013-2014

The list of courses given in the 2013-14 sessions (and also for previous sessions) can be viewed at the MAGIC website at <http://maths-magic.ac.uk/courses.php>.

The above site also gives details of the individual courses and syllabi.

Details of course history and payments for course development have been added to the MAGIC website and can be viewed at [https://maths-magic.ac.uk/admin/programme/course\\_histories.php](https://maths-magic.ac.uk/admin/programme/course_histories.php)

### 3.2. Questionnaires and feedback

An online system of questionnaires was set up in 2007 and implemented from spring 2008 for all the courses delivered. The results of the questionnaire data can be viewed at (login required):

[https://maths-magic.ac.uk/admin/programme/view\\_questionnaires.php](https://maths-magic.ac.uk/admin/programme/view_questionnaires.php)

Since 2012, students registered on MAGIC who are in the final stages of their PhD studies, or who have completed their PhD studies, are asked to complete an online alumni questionnaire. The questionnaire was issued in early April 2014 to students registered for courses in 2010-11. The results may be viewed at the above website. There were 36/280 responses to the questionnaire, which was slight improvement in response rate compared to last year, and most of those responding (22/36) were finishing off their PhD's. On question 3, "Has the training given by MAGIC proved helpful to you in broadening your PhD experience and research?" 15/36 found it mostly helpful or extremely helpful, and 15/36 responded negatively. Also 17/36 said they would recommend MAGIC to someone starting a PhD in Mathematics, with 19/36 having the opposite view. The 2010-11 session was the last year of the initial EPSRC grant which funded MAGIC. The 2011-12 students were the first group required to do formal assessment as well as lecturers being required to undertake 100 hours of formal training at most sites.

Feedback from the lecturers on all the courses has been obtained via online course reports and the responses are available for viewing at the same site (cited earlier) along with other questionnaire results.

The feedback from students and staff (via the questionnaire results, forums discussions) is used by the Programme Committee when they review the programme each year. The minutes of the Programme Committee contain some of the feedback and summarize the outcomes from the review.

### 3.3. Assessment Policies

Following suggestions made at the Academic Steering Committee meeting in 2012, the MAGIC assessment policy was revised and the current MAGIC Course Assessment Policy may be found on the current MAGIC website here:

[https://maths-magic.ac.uk/admin/documentation/documentation\\_index.php](https://maths-magic.ac.uk/admin/documentation/documentation_index.php)

In particular, the current policy requires that each MAGIC course will have a single open-book style examination/assessment at the end of the module, and this will be done over a two week period after the end of the course. Lecturers are required to produce a pass/fail mark for each student requiring assessment, and to give feedback on the assessment via the MAGIC website.

A payment of £10 is made to lecturers for each pass/fail assessment of student recorded on the MAGIC website.

### 3.4. Registration data

The *Table 5* below shows the number of students registered for courses together with the number requiring formal assessment. The corresponding figures for previous years are also displayed in the same table. (It is noted that formal assessment for all courses started with the 2011-12 session). *Table 6* shows the same data but broken down via MAGIC partner.

**Table 5: Total number of course registrations and numbers of students requiring formal assessment. The number of students in the third row is the number of people who registered for at least one course in that session and excludes those names added to the database but not signing up courses.**

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
<b>Registrations (assessed)</b>		649	764	562 (283=50%)	646 (434=67%)	719 (470=65%)
<b>No. of Students</b>	221	236	246	214	256	285

**Table 6: Same data as in Table 5 but broken down by institution. Student numbers is a count of the numbers of students on the database in the particular session who registered for at least one course.**

	2011-12		2012-13		2013-14	
	No. of Students	Registered	No. of Students	Registered	No. of Students	Registered
<b>External</b>	0	0	1	6	1	1
<b>Birmingham</b>	21	57	23	54	17	41
<b>Cardiff</b>	6	19	7	27	11	26
<b>Durham</b>	6	22	6	25	7	17
<b>East Anglia</b>	17	31	13	34	17	60
<b>Exeter</b>	9	24	13	33	15	44
<b>Keele</b>	3	6	1	2	0	0
<b>Lancaster</b>	2	3	3	14	6	29
<b>Leeds</b>	28	52	33	64	41	108
<b>Leicester</b>	2	2	12	24	8	15
<b>Liverpool</b>	26	46	25	45	30	67
<b>Loughborough</b>	24	82	21	65	13	31
<b>Manchester</b>	17	55	33	102	26	54
<b>Newcastle</b>	9	25	10	21	10	19
<b>Northumbria</b>					7	14
<b>Nottingham</b>	7	14	9	16	19	32
<b>Reading</b>	4	6	4	6	3	6
<b>Sheffield</b>	6	23	15	31	15	43
<b>Southampton</b>	14	38	14	36	17	57
<b>Surrey</b>	3	14	4	13	8	21
<b>York</b>	10	43	9	28	14	34
<b>Total</b>	<b>214</b>	<b>562</b>	<b>256</b>	<b>646</b>	<b>285</b>	<b>719</b>

In *Tables 7, 8* we show assessment data for each course broken down by course. In *Tables 9, 10* we show registration data for each node and broken down by course. *Table 11* shows a summary of the data for the last few years.

**Table 7: Autumn 2013-2014 Courses with numbers of registered students and number of students being assessed.**

	Course	Registered	Assessed
<b>MAGIC002</b>	Differential topology and Morse theory (Dirk Schuetz - Durham)	16	7 (43.75%)
<b>MAGIC004</b>	Applications of model theory to algebra and geometry (Dugald MacPherson - Leeds)	15	10 (66.67%)
<b>MAGIC008</b>	Lie groups and Lie algebras (Alexey Bolsinov - Loughborough)	53	44 (83.02%)
<b>MAGIC009</b>	Category Theory (Jonathan Kirby - East Anglia)	46	38 (82.61%)
<b>MAGIC022</b>	Mathematical Methods (Jitesh Gajjar - Manchester)	40	28 (70.00%)
<b>MAGIC057</b>	Spectral Theory of Ordinary Differential Operators (Karl Michael Schmidt - Cardiff)	6	4 (66.67%)
<b>MAGIC059</b>	Dynamical Systems I (Flows) (Alastair Rucklidge - Leeds)	20	11 (55.00%)
<b>MAGIC060</b>	Dynamical Systems II (Maps) (Toby Hall - Liverpool)	6	4 (66.67%)
<b>MAGIC061</b>	Functional Analysis (Martin Lindsay - Lancaster)	21	13 (61.90%)
<b>MAGIC063</b>	Differentiable Manifolds (Kostas Skenderis - Southampton)	25	22 (88.00%)
<b>MAGIC066</b>	Numerical Analysis (Tim Phillips - Cardiff)	36	25 (69.44%)
<b>MAGIC069</b>	Introduction to Quantum Information (Roger Colbeck - York)	10	5 (50.00%)
<b>MAGIC071</b>	Erlangen program in geometry and analysis: $SL(2, \mathbb{R})$ case study (Vladimir V. Kisil - Leeds)	9	5 (55.56%)
<b>MAGIC073</b>	Commutative Algebra (Neil Strickland - Sheffield)	41	36 (87.80%)
<b>MAGIC076</b>	The Heisenberg group in mathematics and physics (Vladimir V. Kisil - Leeds)	13	6 (46.15%)
<b>MAGIC080</b>	Geometric Mechanics (Cesare Tronci - Surrey)	6	5 (83.33%)
<b>MAGIC081</b>	String Theory (Thomas Mohaupt - Liverpool)	20	6 (30.00%)
<b>MAGIC084</b>	Singularity Theory (Victor Goryunov - Liverpool)	10	1 (10.00%)
<b>Total</b>		<b>384</b>	<b>265 (69.01%)</b>

**Table 8: Spring 2013-2014 courses showing numbers registered and numbers of students being assessed.**

	Course	Registered	Assessed
<b>MAGIC010</b>	Ergodic Theory (Charles Walkden - Manchester)	15	10 (66.67%)
<b>MAGIC014</b>	Hydrodynamic Stability Theory (Jonathan Healey - Keele)	15	12 (80.00%)
<b>MAGIC021</b>	Nonlinear Waves (Roger Grimshaw - Loughborough)	18	11 (61.11%)
<b>MAGIC040</b>	Operator Algebras (Michael Dritschel - Newcastle)	7	2 (28.57%)
<b>MAGIC044</b>	Complex Differential Geometry (John Wood - Leeds)	18	10 (55.56%)
<b>MAGIC049</b>	Modular Forms (Herbert Gangl - Durham)	17	8 (47.06%)
<b>MAGIC050</b>	Set Theory (David Aspero - East Anglia)	26	15 (57.69%)
<b>MAGIC052</b>	Topological Fluid Mechanics (Andrew Gilbert - Exeter)	14	10 (71.43%)
<b>MAGIC058</b>	Theory of Partial Differential Equations (David Harris - Manchester)	26	19 (73.08%)
<b>MAGIC062</b>	Introductory Functional Analysis (John Pryce - Cardiff)	21	14 (66.67%)
<b>MAGIC064</b>	Algebraic Topology (Frank Neumann - Leicester)	36	24 (66.67%)
<b>MAGIC072</b>	Number Theory (Jayanta Mnoharmayum - Sheffield)	22	13 (59.09%)
<b>MAGIC074</b>	Algebraic Geometry (Steve Donkin - York)	29	17 (58.62%)
<b>MAGIC075</b>	Representation Theory of Groups (Kay Magaard - Birmingham)	28	16 (57.14%)
<b>MAGIC079</b>	Inverse Problems (Daniel Lesnic - Leeds)	14	7 (50.00%)
<b>MAGIC082</b>	Banach Spaces of Analytic Functions (Jonathan Partington - Leeds)	15	9 (60.00%)
<b>MAGIC083</b>	Integrable Systems (Alexander Mikhailov - Leeds)	16	7 (43.75%)
<b>Total</b>		<b>337</b>	<b>204 (60.53%)</b>

Table 9: Data for autumn 2013-2014 courses showing registration data broken down by node and course code. Note that in the 'Autumn Course code' row, the number in bold refers to a MAGIC course code, e.g. 061 is MAGIC061.

Autumn course code:	002	004	008	009	022	057	059	060	061	063	066	069	073	076	080	081	084	Node Totals
External																		0
Birmingham	1	1	1	2	3	1	2	2	2	1	3		4	1				24
Cardiff			2	1	5	1			1		4		1	1		1		17
Durham	1	2	3	2						1			2			1	1	13
East Anglia		2	4	4					2	1	4		8		2	1		28
Exeter			2	2	1		3		1		4		5		1	1		20
Keele																		0
Lancaster			6	3					1	1		1	2	2				16
Leeds	1	6	7	9	5				2	5	6	1	3	2	1	2		50
Leicester			1	1	1				1		2							6
Liverpool	3		3	1	10	2	1	1	3	1	2	1	1	2		4	4	39
Loughborough			3		4	1		2	1	3	1		1	1		2	2	28
Manchester	1		4	1	1		5		1	1	5	2	1		2	2	2	28
Newcastle			2	2	1				1		2	1	1					10
Northumbria			1		3		1	1					1				1	8
Nottingham	1		2	2		1	2					1	1	3		2		15
Reading					1				1									2
Sheffield	4		4	6					2	1			4					21
Southampton	4	1	3	5	2					8			5			1		29
Surrey			4	2			2		1	1	2	1		1		2		16
York		3	1	3	3		4		1	1	1	2	1			1		21
Autumn course code:	<b>002</b>	<b>004</b>	<b>008</b>	<b>009</b>	<b>022</b>	<b>057</b>	<b>059</b>	<b>060</b>	<b>061</b>	<b>063</b>	<b>066</b>	<b>069</b>	<b>073</b>	<b>075</b>	<b>080</b>	<b>081</b>	<b>084</b>	
Course Totals	16	15	53	46	40	6	20	6	21	25	36	10	41	13	6	20	10	384

Table 10: Data for spring 2012-2013 showing registration data broken down by node and course code.

Spring course code:	010	014	021	040	044	049	050	052	058	062	064	072	074	075	079	082	083	Node Totals
External																	1	1
Birmingham	1		2	1			3		2	2	2	1	1	2		2		19
Cardiff	1	2						1	2	1		1			1			9
Durham					3	1												4
East Anglia	1	2	3			3	5	2	2	2	1	5	3	3				32
Exeter	2	3	1		1	2		2	1	2	3	3	4					24
Keele																		0
Lancaster	1			1			1			1	2		3	1		3		13
Leeds	1	2	4		5	2	8	2			5	1	5	7	6	5	5	58
Leicester		1	1				1		3		3							9
Liverpool	2		2	1	2	2		1	7	3	1	2	2		1	1	1	28
Loughborough	1	1	1		1							1					5	10
Manchester		1			1		1	3	4	4	1	4	2	1	4			26
Newcastle		2	2	1			1			2				1				9
Northumbria		1	1										1	1			2	6
Nottingham					1	1			1	1	6		2	1	1	3		17
Reading				1											1	1	1	4
Sheffield				1	2	1				1	6	2	2	7				22
Southampton	2				1	2	4	3	2	1	6	2	3	2				28
Surrey					1	2			1					1				5
York	3		1	1		1	2		1	1			1	1			1	13
Spring course code:	<b>010</b>	<b>014</b>	<b>021</b>	<b>040</b>	<b>044</b>	<b>049</b>	<b>050</b>	<b>052</b>	<b>058</b>	<b>062</b>	<b>064</b>	<b>072</b>	<b>074</b>	<b>075</b>	<b>079</b>	<b>082</b>	<b>083</b>	
Course Totals	15	15	18	7	18	17	26	14	26	21	36	22	29	28	14	15	16	337

Table 11: Summary of registration data per node.

	2009-10			2010-11			2011-12			2012-13			2013-14		
	Autumn	Spring	Total	Autumn	Spring	Total	Autumn	Spring	Total	Autumn	Spring	Total	Autumn	Spring	Total
<b>External</b>										3	3	6	0	1	1
<b>Birmingham</b>	42	19	61	22	22	44	28	29	57	28	26	54	22	19	41
<b>Cardiff</b>	18	13	31	17	11	28	11	8	19	13	14	27	17	9	26
<b>Durham</b>	19	29	48	14	9	23	8	14	22	16	9	25	13	4	17
<b>East Anglia</b>	15	13	28	27	18	45	16	15	31	22	12	34	28	32	60
<b>Exeter</b>	19	17	36	38	20	58	12	12	24	11	22	33	20	24	44
<b>Keele</b>	5	1	6	3	0	3	2	4	6	1	1	2	0	0	0
<b>Lancaster</b>	5	1	6	23	14	37	2	1	3	8	6	14	16	13	29
<b>Leeds</b>	22	55	77	29	25	54	28	24	52	33	31	64	50	58	108
<b>Leicester</b>	4	2	6	8	6	14	2	0	2	15	9	24	6	9	15
<b>Liverpool</b>	16	10	26	15	10	25	22	24	46	22	23	45	39	28	67
<b>Loughborough</b>	40	43	83	60	61	121	51	31	82	35	30	65	21	10	31
<b>Manchester</b>	67	41	108	73	81	154	29	26	55	51	51	102	28	26	54
<b>Newcastle</b>	8	21	29	20	16	36	17	8	25	13	8	21	10	9	19
<b>Northumbria</b>													8	6	14
<b>Nottingham</b>	22	5	27	2	5	7	7	7	14	11	5	16	15	17	32
<b>Reading</b>	5	4	9	9	2	11	5	1	6	5	1	6	2	4	6
<b>Sheffield</b>	11	6	17	26	11	37	10	13	23	19	12	31	21	22	43
<b>Southampton</b>	8	10	18	20	11	31	18	20	38	22	14	36	29	28	57
<b>Surrey</b>	2	1	3	12	0	12	6	8	14	8	5	13	16	5	21
<b>York</b>	23	7	30	12	12	24	23	20	43	18	10	28	21	13	34
<b>Total</b>	<b>351</b>	<b>298</b>	<b>649</b>	<b>430</b>	<b>334</b>	<b>764</b>	<b>297</b>	<b>265</b>	<b>562</b>	<b>354</b>	<b>292</b>	<b>646</b>	<b>382</b>	<b>337</b>	<b>719</b>