

**Introductory Workshop: Model Theory,
Arithmetic Geometry and Number Theory**

February 3 - 7, 2014

MSRI, Berkeley, CA, USA

Organizers:

Elisabeth Bouscaren (Centre National de la Recherche Scientifique)

Antoine Chambert-Loir (Université Paris-Sud (Orsay))

Rahim Moosa (University of Waterloo)

**FINAL REPORT ON THE MSRI INTRODUCTORY WORKSHOP
*MODEL THEORY, ARITHMETIC GEOMETRY,
AND NUMBER THEORY***

Organisers

Elisabeth Bouscaren (CNRS – Université Paris-Sud, Orsay)

Antoine Chambert-Loir (Université Paris-Sud, Orsay)

Rahim Moosa (University of Waterloo), Lead

1. GOALS, STRUCTURE, AND OUTCOMES OF THE WORKSHOP

The last model theory program at MSRI, *Model theory of Fields*, was in the spring of 1998. A central focus then was the spectacular applications of model theory to diophantine geometry stemming from Hrushovski's work on the function field Mordell-Lang Conjecture in all characteristics. The current program, *Model Theory, Arithmetic Geometry, and Number Theory* reflects a new round of striking applications of model theory to algebraic and analytic geometry, number theory, and additive combinatorics. The sheer breadth of these recent applications poses a significant challenge to the program: how to bring together in a meaningful way so diverse a group of participating mathematicians. It was natural that the Introductory Workshop should take up this challenge, and the central goal of the Workshop was to expose the participants quickly, but thoroughly, to the ideas, techniques, and problems at the heart of these recent applications.

The Workshop's structure reflected this goal. It was centered around three series of tutorials, each one addressing a particularly fruitful area of current model theoretic applications: diophantine geometry, Berkovich spaces, and combinatorics. The goal of these tutorials was to describe the motivating problems in the subject, explain in depth the nature of the recent accomplishments, and give some idea of how these results were achieved. In order to maximise the benefit the audience would derive from these tutorials, we included a fourth pre-tutorial introducing the techniques of model theory. To these tutorials we also attached several complementary research talks on current work and future directions.

A key aspect of our strategy was to have the main tutorial talks given by people who were known to have deeply penetrated the area, but were not necessarily themselves directly responsible for the recent developments that they were exposing. The idea was that the speaker should be a little bit of an outsider so as to better empathise with the program participants being tutored.

By all accounts the Workshop was a resounding success. There was an unusual amount of cross-referencing between the tutorials, and the reappearance of the same themes in various guises contributed to a well-rounded and deeper understanding. The talks were of a very high quality, and an impressive amount of effort was put into speaking to mathematicians from the "other side". The introductory workshop has contributed significantly to the breadth and depth of the conversations and collaborations that have since been carried on within the program.

2. PRESENTATIONS

2.1. Introduction to Model Theory. Speaker: Pierre Simon (CNRS)

This was the pre-tutorial aimed at those not familiar with the methods of model theory. It was three hours long and focused on techniques that were then employed by the other tutorials. The topics included pseudofinite structures, stability, NIP, and measures. A highlight was that there were no logic prerequisites whatsoever, and yet Simon covered some very sophisticated ideas from model theory.

2.2. Diophantine Geometry. Speakers:

Ekaterina Amerik (Higher School of Economics)
 Antoine Chambert-Loir (Université Paris-Sud, Orsay)
 Alice Medvedev (City College, CUNY)
 Ya'acov Peterzil (University of Haifa)
 Anand Pillay (University of Notre Dame)
 Margaret Thomas (Universität Konstanz)

These tutorials were split into two sub-themes. Chambert-Loir gave a three hour series of talks motivating and explaining the various diophantine theorems and conjectures that are at the center of the semester program. These include Mordell-Lang, Manin-Mumford, André-Oort, and Pink-Zilber. The other speakers, amounting to another seven hours, explored the various ways that model theory intervenes in these problems. Pillay spoke about how stability theoretic techniques apply, and Thomas and Peterzil focused on the role of o-minimality via the Pila-Wilkie theorem. Amerik and Medvedev gave research talks on the application of model-theoretic techniques to algebraic dynamics.

2.3. Berkovich Spaces. Speakers:

Deirdre Haskell (McMaster University)
 Martin Hils (Université Paris Diderot – Paris VII)

This was a very focused tutorial of four hours duration on the model theoretic constructions behind the recent topological tameness results of Hrushovski and Loeser for the Berkovich analytification of algebraic varieties over complete non-archimidean absolute valued fields. Haskell introduced the model theory of algebraically closed valued fields, which is the structure in which Hrushovski and Loeser work, and Hils gave a very detailed explanation of the construction of the model-theoretic manifestation of the Berkovich space.

2.4. Combinatorics. Speakers:

Ehud Hrushovski (Hebrew University)
 Terence Tao (University of California, Los Angeles)
 Lou van den Dries (University of Illinois at Urbana-Champaign)

This theme began with Hrushovski's talk on the relations between model theory, combinatorics, and locally compact groups, that underlies the recent application of his work by Breuillard-Green-Tao determining the structure of approximate subgroups. The ideas that Hrushovski discussed were then worked out in detail by Van den Dries in a three hour tutorial. Tao continued the theme of model theory and combinatorics, especially the role played by ultraproducts and pseudofinite structures, in a talk on his recent Algebraic Regularity Lemma.

Organizers		
First	Last	Institutions
Elisabeth	Bouscaren	Universite Paris-Sud (Orsay)
Antoine	Chambert-Loir	Universite de Paris XI (Paris-Sud)
Rahim	Moosa	University of Waterloo

Speakers		
First	Last	Institutions
Ekaterina	Amerik	Higher School of Economics
Antoine	Chambert-Loir	Universite de Paris XI (Paris-Sud)
Deirdre	Haskell	McMaster University
Martin	Hils	Universite de Paris VII (Denis Diderot)
Alice	Medvedev	City College, CUNY
Ya'acov	Peterzil	University of Haifa
Anand	Pillay	University of Notre Dame
Pierre	Simon	Centre national de la recherche scientifique (CNRS)
Terence	Tao	University of California, Los Angeles
Margaret	Thomas	Universitat Konstanz
Lou	van den Dries	University of Illinois at Urbana-Champaign



Introductory Workshop: Model Theory, Arithmetic Geometry and Number Theory

February 3 - 7, 2014

Schedule

Monday, February 3, 2014			
9:15 AM - 9:30 AM	Simons Auditorium		Welcome
9:30 AM - 10:30 AM	Simons Auditorium	Antoine Chambert-Loir	Specialities for non-specialists
10:30 AM - 11:00 AM	Atrium		Tea
11:00 AM - 12:00 PM	Simons Auditorium	Pierre Simon	An Introduction to Stability-Theoretic Techniques
12:00 PM - 2:00 PM	Atrium		Lunch
2:00 PM - 3:00 PM	Simons Auditorium	Deirdre Haskell	A model-theorist's view of algebraically closed valued fields
3:00 PM - 4:00 PM	Atrium		Tea
4:00 PM - 5:00 PM	Evans Hall	Ehud Hrushovski	MSRI/Evans Lecture: Talk Title

Note: Special Charter buses will leave MSRI at 3:10 and 3:40 for Evans Hall

Tuesday, February 4, 2014			
9:30 AM - 10:30 AM	Simons Auditorium	Antoine Chambert-Loir	Specialities for non-specialists
10:30 AM - 11:00 AM	Atrium		Tea
11:00 AM - 12:00 PM	Simons Auditorium	Pierre Simon	An Introduction to Stability-Theoretic Techniques
12:00 PM - 1:30 PM	Atrium		Lunch
1:30 PM - 2:00 PM	Simons Auditorium	Ekaterina Amerik	Some applications of Hrushovski's theorem about the Frobenius map to algebraic dynamics
2:30 PM - 3:30 PM	Simons Auditorium	Martin Hils	A Model Theoretic Approach to Berkovich Spaces
3:30 PM - 4:00 PM	Atrium		Tea
4:00 PM - 5:00 PM	Simons Auditorium	Lou van den Dries	Model theory and multiplicative combinatorics
5:00 PM - 7:00 PM	Atrium		Reception

Note: Special Charter buses will leave MSRI at 6:30 and 7:00 for Evans Hall

Wednesday, February 5, 2014			
9:30 AM - 10:30 AM	Simons Auditorium	Antoine Chambert-Loir	Specialities for non-specialists
10:30 AM - 11:00 AM	Atrium		Tea
11:00 AM - 12:00 PM	Simons Auditorium	Pierre Simon	An Introduction to Stability-Theoretic Techniques
12:00 PM - 1:00 PM	Simons Auditorium	Margaret Thomas	The Pila-Wilkie

Thursday, February 6, 2014			
9:30 AM - 10:30 AM	Simons Auditorium	Martin Hils	A Model Theoretic Approach to Berkovich Spaces
10:30 AM - 11:00 AM	Atrium		Tea
11:00 AM - 12:00 PM	Simons Auditorium	Anand Pillay	Stability theory and Diophantine geometry
12:00 PM - 1:30 PM	Atrium		Lunch
1:30 PM - 2:30 PM	Simons Auditorium	Ya'acov Peterzil	O-Minimal Ingredients in Proofs of Arithmetical Conjectures Such as Manin-Mumford and Andre-Oort
2:30 PM - 3:30 PM	Simons Auditorium	Lou van den Dries	Model theory and multiplicative combinatorics
3:30 PM - 4:00 PM	Atrium		Tea
4:00 PM - 5:00 PM	Simons Auditorium	Terence Tao	A regularity lemma for definable sets over finite fields, and expanding polynomials

Friday, February 7, 2014			
9:30 AM - 10:30 AM	Simons Auditorium	Martin Hils	A Model Theoretic Approach to Berkovich Spaces
10:30 AM - 11:00 AM	Atrium		Tea
11:00 AM - 12:00 PM	Simons Auditorium	Anand Pillay	Stability theory and Diophantine geometry
12:00 PM - 1:30 PM	Atrium		Lunch
1:30 PM - 2:30 PM	Simons Auditorium	Ya'acov Peterzil	O-Minimal Ingredients in Proofs of Arithmetical Conjectures Such as Manin-Mumford and Andre-Oort
2:30 PM - 3:30 PM	Simons Auditorium	Alice Medvedev	Algebraic Dynamics and the Model Theory of Difference Fields
3:30 PM - 4:00 PM	Atrium		Tea
4:00 PM - 5:00 PM	Simons Auditorium	Lou van den Dries	Model theory and multiplicative combinatorics

Participants		
First	Last	Institutions
Nate	Ackerman	Harvard University
Emrah	Akyar	Anadolu (Anatolia) University
Manuel	Alves	CUNY, Graduate Center
Uri	Andrews	University of Wisconsin
Will	Anscombe	University of Leeds
Matthias	Aschenbrenner	University of California, Los Angeles
Vahagn	Aslanyan	University of Oxford
Matti	Astrand	University of Pennsylvania
John	Baldwin	University of Illinois
Francesca	Balestrieri	University of Oxford
Eliana	Barriga Turriago	Universidad de los Andes
Fabrizio	Barroero	Scuola Normale Superiore
Franck	Benoist	Universite Paris-Sud (Orsay)
Jennifer	Berg	University of Texas
Ozlem	Beyarslan	Bogazici University (University of the Bosphorus)
Arindam	Biswas	Universite Paris-Sud (Orsay)
Anton	Bobkov	University of California, Los Angeles
Will	Boney	Carnegie-Mellon University
Santiago	Camacho	University of Illinois at Urbana-Champaign
Antonio de Jesus	Campos Rodriguez	Universiteit Leiden
Laura	Capuano	Scuola Normale Superiore
Josh	Carmichael	Bucks County Community College
Maria	Carrizosa	Universite Lyon 1
Erin	Caulfield	University of Illinois at Urbana-Champaign
Juan Diego	Caycedo	Albert-Ludwigs-Universitat Freiburg
Jorge	Cely	University of Pittsburgh
Mei-Chu	Chang	University of California
Zoe	Chatzidakis	Centre National de la Recherche Scientifique (CNRS)
Artem	Chernikov	Institut de Mathematiques de Jussieu - Paris Rive Gauche
Sunil	Chetty	College of St Benedict and St John's University
Dohoon	choi	Korea aerospace university
youn-seo	choi	Korea Institute for Advanced Study
Derya	Ciray	Universitat Konstanz
William	Cocke	Brigham Young University
Georges	Comte	Universite de Savoie (Chambery)
Gabriel	Conant	University of Illinois
Annalisa	Conversano	Massey University
David	Corwin	Massachusetts Institute of Technology
Gregory	Cousins	University of Notre Dame
Reid	Dale	University of Washington
Paola	D'Aquino	Seconda Universita di Napoli
Christopher	Daw	University College London
Juan	de Vicente	Autonomous University of Madrid
Francoise	Delon	Centre National de la Recherche Scientifique
Benjamin	DRUART	Universite Claude-Bernard (Lyon I)
Antoine	Ducros	Universite Paris VI
Taylor	Dupuy	University of California, Los Angeles
Clifton	Ealy	Western Illinois University

Kirsten	Eisentraeger	Pennsylvania State University
ESTHER	ELBAZ	Universite de Paris VII (Denis Diderot)
Pantelis	Eleftheriou	Universitat Konstanz
bernadette	Faye	AIMS Senegal
Arthur	Forey	Ecole Normale Superieure
Brett	Frankel	University of Pennsylvania
James	Freitag	University of California, Berkeley
Ziyang	GAO	Universite Paris-Sud (Orsay)
Natalia	Garcia	Queen's University
Dario	Garcia	Universidad de los Andes
Allen	Gehret	University of Illinois at Urbana-Champaign
Danielle	GONDARD-COZETTE	Universite de Paris VI (Pierre et Marie Curie)
Heidi	Goodson	University of Minnesota Twin Cities
Vincent	Guingona	University of Notre Dame
Joseph	Gunther	CUNY, Graduate Center
Priya	Gupta	Purvanchal University
Adam	Gutter	Carnegie Mellon University
Ali	Hakami	Jazan University
Tigran	Hakobyan	University of Illinois at Urbana-Champaign
Yatir	Halevi	Hebrew University
Gwyneth	Harrison-Shermoen	UC Berkeley Math Faculty
Michael	Haskel	University of Notre Dame
Aloysius	Helminck	North Carolina State University
Nadja	Hempel	Universite Claude-Bernard (Lyon I)
C Ward	Henson	University of Illinois at Urbana-Champaign
Cameron	Hill	Wesleyan University
Meng-Che	Ho	University of Wisconsin
Bo-Hae	Im	Chung-Ang University
Franziska	Jahnke	Westfalische Wilhelms-Universitat Munster
ANUJ	JAKHAR	Indian Institute of Science Education and Research Mohali
Tiago	Jardim da Fonseca	Universite Paris-Sud (Orsay)
Alena	Jassova	University of Liverpool
Seongmin	Jeong	Yonsei University
Ruizhang	Jin	University of Waterloo
Moshe	Kamensky	Hebrew University
Itay	Kaplan	Hebrew University
Charlotte	Kestner	University of Central Lancashire
adel	khalfallah	King Fahd University of Petroleum and Minerals
Mohamed	Khalifa	Central European University
Mohsen	Khani	Albert-Ludwigs-Universitat Freiburg
Hiroataka	Kikyo	Kobe University
SunYoung	Kim	Yonsei University
Joonhee	Kim	Yonsei University
Byunghan	Kim	Yonsei University
Alexander	Knop	Steklov Mathematical Institute, St. Petersburg
Holly	Krieger	Massachusetts Institute of Technology
Alex	Kruckman	University of California, Berkeley
Therese	Landry	San Francisco State University
Michael	Larsen	Indiana University
Wan	Lee	Yonsei University

JUNGUK	LEE	Yonsei University
Eva	Leenknecht	Purdue University
Omar	Leon Sanchez	McMaster University
Francois	Loeser	Universite de Paris VI (Pierre et Marie Curie)
Amena	Mahmoud	Cairo University
Ali	Mahmoud	Cairo University
Mohammad	Mahmoud	Cairo University
Edson	Makuluni	University of Wisconsin
Maryanthe	Malliaris	University of Chicago
Guillermo	Mantilla-Soler	Ecole Polytechnique Federale de Lausanne (EPFL)
David	Marker	University of Illinois
Florent	Martin	Universite de Lille I (Sciences et Techniques de Lille Flandres Artois)
Jean-Francois	MARTIN	Ecole Normale Superieure
Jean-Cyrille	Massicot	Universite de Lyon 1
Niki Myrto	Mavraki	University of British Columbia
Barry	Mazur	Harvard University
Emmanuel	Mensah	University of L'Aquila
Timothy	Mercure	University of Maryland
Daniel	Meyer	Ohio State University
Samaria	Montenegro-Guzman	Universite de Paris VII (Denis Diderot)
Rahim	Moosa	University of Waterloo
Joel	Nagloo	University of Leeds
Iwuchukwu	Ndukwe	university of Nigeria Nsukka
Dong Quan	Nguyen	University of British Columbia
Johannes	Nicaise	Katholieke Universiteit Leuven
Victoria	Noquez	University of Illinois
Paige	North	University of Cambridge
Trent	Ohl	Ohio State University
Alf	Onshuus	Universidad de los Andes
Koushik	Pal	University of Saskatchewan
Marina	Papkovich	Polotsk State University
Donghoon	Park	Yonsei University
Rehana	Patel	Olin College of Engineering
Sam	Payne	Yale University
Francoise	Point	Universite de Mons
PRASANTA	RAY	International Institute of Information and Technology, Bhubaneswar
Prasanta	Ray	IIIT, Bhubaneswar
Nathalie	Regnault	Universite Libre de Bruxelles
Nathan	Rehfuss	University of Illinois at Urbana-Champaign
Alex	Rennet	University of Toronto
Silvain	Rideau	Ecole Normale Superieure
Emily	Riehl	Harvard University
mohan	rudravarapu	GOVERNMENT POLYTECHNIC
Carlos	Ruiz Guido	Universite Paris-Sud (Orsay)
Harry	Schmidt	Universitat Basel
Philip	Scowcroft	Wesleyan University
Alisa	Sedunova	Ecole Normale Superieure
Mehmet Haluk	Sengun	University of Warwick
Shahed	Sharif	CSU San Marcos
William	Simmons	University of California, Los Angeles

Michael	Singer	North Carolina State University
Bismark	Singh	University of Texas
Filip	Sladek	University of Oxford
Saronsad	Sokantika	Chulalongkorn University
Luis	Sordo Vieira	University of Kentucky
Suresh	Srinivasamurthy	Kansas State University
Sergei	Starchenko	University of Notre Dame
Kristian	Strommen	University of Oxford
Caroline	Terry	University of Illinois at Chicago
Athipat	Thamrongthanyalak	Chulalongkorn University
Vladimir	Tonchev	Michigan Technological University
Adam	Topaz	University of California, Berkeley
Minh	Tran	University of Illinois at Urbana-Champaign
Marcus	Tressl	University of Manchester
Maciej	Ulas	Jagiellonian University
Somayeh	Vojdani	University of Notre Dame
Paul	Vojta	University of California, Berkeley
erik	walsberg	University of California, Los Angeles
Gary	Walsh	University of Ottawa
Michael	Wan	University of California, Berkeley
Carol	Wood	Wesleyan University
Jie	Xia	Columbia University
Myungjun	Yu	University of California, Irvine
Jon	Ziegler	Unknown School
Julian	Ziegler Hunts	none
Hong	Zong	Princeton University

Officially Registered Participant Information

Participants		129
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Gender		129
Male	70.54%	91
Female	27.91%	36
Declined to state	1.55%	2

Ethnicity*		129
White	51.16%	66
Asian	19.38%	25
Hispanic	8.53%	11
Pacific Islander	0.00%	0
Black	3.10%	4
Native American	0.00%	0
Mixed	4.65%	6
Declined to state	13.18%	17

* ethnicity specifications are not exclusive

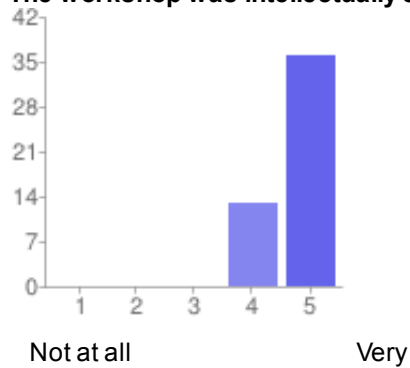
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49 [responses](#)

Summary [See complete responses](#)

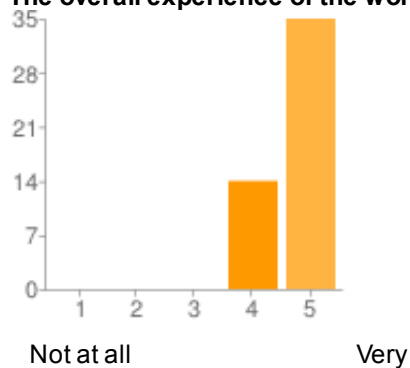
Workshop assessment

The workshop was intellectually stimulating



1 - Not at all	0	0%
2	0	0%
3	0	0%
4	13	27%
5 - Very	36	73%

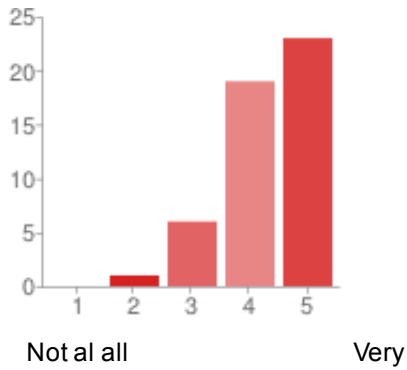
The overall experience of the workshop was worthwhile



1 - Not at all	0	0%
2	0	0%
3	0	0%
4	14	29%
5 - Very	35	71%

The time between lectures was adequate for discussion

1 - Not at all	0	0%
2	1	2%
3	6	12%
4	19	39%
5 - Very	23	47%

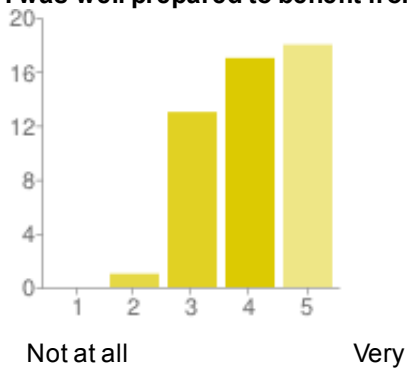


Additional comments on the workshop organization

Excellent; everything was very smooth. if we can download the slide files, it would be also helpful as much as video files. Excellent I would have also asked the people who did actually proved the res ...

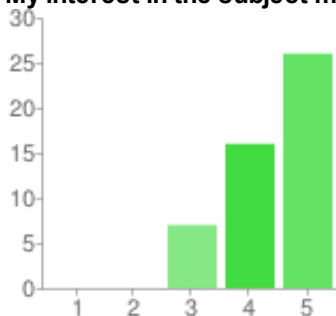
Personal assessment

I was well prepared to benefit from the lectures



1 - Not at all	0	0%
2	1	2%
3	13	27%
4	17	35%
5 - Very	18	37%

My interest in the subject matter was increased by the workshop

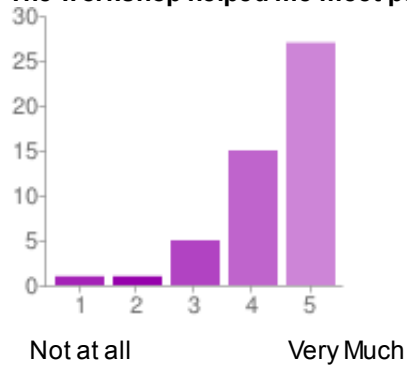


1 - Niot at all	0	0%
2	0	0%
3	7	14%
4	16	33%
5 - Very	26	53%

Not at all

Very

The workshop helped me meet people with similar scientific interests



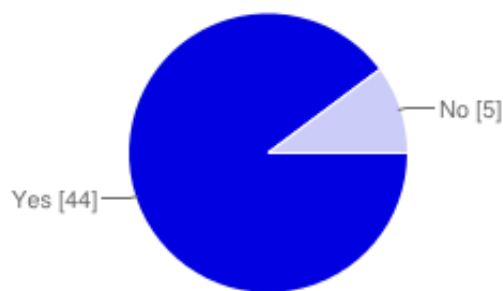
1 - Not at all	1	2%
2	1	2%
3	5	10%
4	15	31%
5 - Very Much	27	55%

Additional comments on your personal assessment

Excellent I had attended lectures on these subjects and I found sometimes that it was both too easy and rather difficult to follow very nice programme, very well designed. The level of the lectures wa ...

Additional Activities

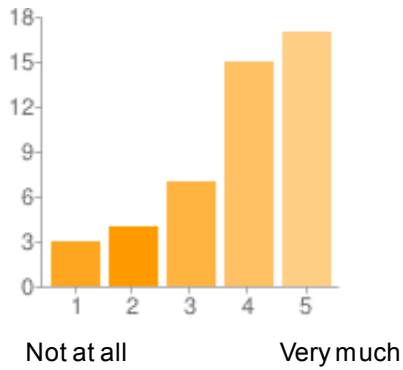
Did you attend the reception?



Yes	44	90%
No	5	10%

If you did attend the reception, did it help to solidify the contacts you made in the workshop?

1 - Not at all	3	6%
2	4	8%
3	7	14%



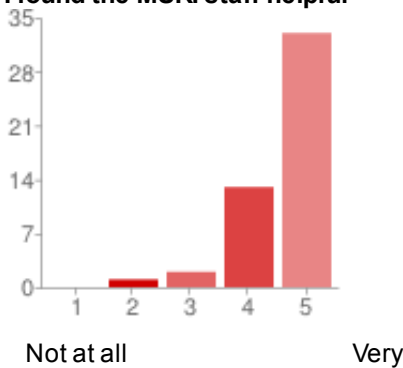
4	15	31%
5 - Very much	17	35%

Please provide any comments on the reception

At the reception, I have not been pursuing the aim of solidifying contacts, that's all
 :) Excellent it was friendly There were
 so many people in the little space that discussion was hard. I talked to p ...

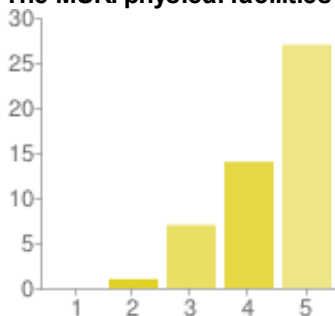
Venue

I found the MSRI staff helpful



1 - Not at all	0	0%
2	1	2%
3	2	4%
4	13	27%
5 - Very	33	67%

The MSRI physical facilities were conducive for such a workshop

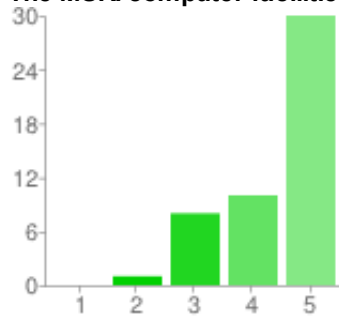


1 - Not at all	0	0%
2	1	2%
3	7	14%
4	14	29%
5 - Very	27	55%

Not at all

Very

The MSRI computer facilities were adequate for such a workshop

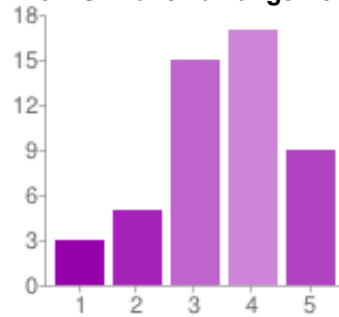


1 - Not at all	0	0%
2	1	2%
3	8	16%
4	10	20%
5 - Very	30	61%

Not at all

Very

The MSRI lunch arrangements were satisfactory

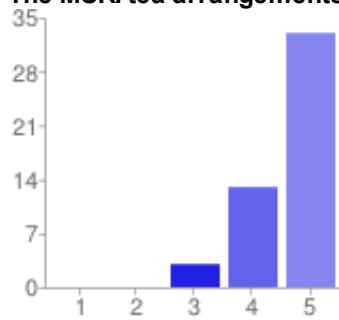


1 - Not at all	3	6%
2	5	10%
3	15	31%
4	17	35%
5 - Very	9	18%

Not at all

Very

The MSRI tea arrangements were satisfactory



1 - Not at all	0	0%
2	0	0%
3	3	6%
4	13	27%
5 - Very	33	67%

Not at all

Very

Additional comments on the venue

1) The auditorium (Simons) is very nice. But there is a real problem when sitting on one of the side parts in the room. It is very difficult to read what is written on a blackboard in this case. The ...

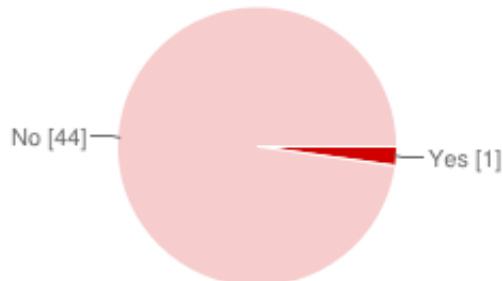
MSRI Wireless Network

Did you use MSRI's wireless network?



Yes	45	92%
No	4	8%

Did you experience any difficulties with the network?



Yes	1	2%
No	44	90%

If you did experience difficulties with the network, please explain:

The laptop wireless was fine. I never managed to login in room 2o5 to print. The machines did not accept the id's and passwords suggested. I did print from the library

Thank you for completing this survey

We welcome any additional comments or suggestions you may have to improve the overall experience for future participants.

would be nice to have a kind of visitor's room (shared office) for people who are not members but come for somewhat longer than the workshop, in order to benefit from the discussions with members I e ...

Number of daily responses



Introductory Workshop: Model Theory, Arithmetic Geometry and Number Theory February 3 - 7, 2014

Additional Survey Responses

Additional comments on your personal assessment

- Excellent
- I had attended lectures on these subjects and I found sometimes that it was both too easy and rather difficult to follow
- very nice programme, very well designed.
- The level of the lectures was perfect for me: I could follow the lectures if I paid good attention, but it wasn't easy and I learned a ton. In the later afternoon talks I was often so exhausted that it was hard to follow with enough attention.

Additional comments on the venue

- 1) The auditorium (Simons) is very nice. But there is a real problem when sitting on one of the side parts in the room. It is very difficult to read what is written on a blackboard in this case. There were many people at the workshop, so it was necessary to reserve a good seat before a talk if one wanted to actually see everything.
- Excellent
- tea is very nice with always fruits provided
- conference room: hard to view the blackboard from the sides; low quality, long queue at lunch; color problems with the beamer presentations
- The auditorium is very problematic. One cannot see well from the sides, the beamer projector does not work well (the colors are not right) and the acoustics is quite bad.
- screen of projection trembling, sound not very good
- I think the arrangement of the tables for tea, etc could be improved to avoid unnecessarily long queues.
- it is not suitable for large numbers of participants.
- The Simons auditorium has a strange design. On the right side, the morning daylight reflects from the blackboard and it is hard to read. The seats in the back rows in the middle are blocked by the desks in the front. In the front rows there could be many more good seats if they were more dense. There is a constant supply of fresh coffee on every floor.
- I did not find the staff particularly friendly, and I also found that the suggested accommodation was very expensive, most conferences I have been to in this situation try to pair people together to share rooms to reduce the costs. This would have been very helpful.

We welcome any additional comments or suggestions you may have to improve the overall experience for future participants.

- would be nice to have a kind of visitor's room (shared office) for people who are not members but come for somewhat longer than the workshop, in order to benefit from the discussions with members
- I enjoyed this workshop!!

- I found that when one is sitting on the sides that one cannot see very well and I did not like to reserve a seat in the middle

If you did experience difficulties with the network, please explain:

- The laptop wireless was fine. I never managed to login in room 205 to print. The machines did not accept the id's and passwords suggested. I did print from the library

Please provide any comments on the reception

- At the reception, I have not been pursuing the aim of solidifying contacts, that's all :)
- Excellent
- it was friendly
- There were so many people in the little space that discussion was hard. I talked to people more at other times. The food was great!
- I feel a sit down meal allows more time to have meaningful conversations

Additional comments on the workshop organization

- Excellent; everything was very smooth.
- if we can download the slide files, it would be also helpful as much as video files.
- Excellent
- I would have also asked the people who did actually proved the results to interact more--I felt a bit frustating at times--since they were also attending the talks
- Very good
- Perhaps too many talks per day...
- It would have been convenient to have extra shuttles scheduled for the end of the day.