Over-all Program

Mon, July 11			Auditorium	Room 2006	Room 3028	FU	FU
9:00 – 9:25	Registration		Registration				
9:25 – 9:30	Opening		Opening				
9:30 – 10:30	Plenary Talk		Jack Dongarra				
10:30 – 11:00	Break		Break				
11:00 – 12:40	Parallel Sessions		2.1	11.1	5.1		
12:40 – 14:00	Lunch		Lunch				
13:30 – 14:00	Registration		Registration				
14:00 – 15:40	Parallel Sessions		2.2	11.2	5.2		
15:40 – 16:00	Break		Break				
16:00 – 17:40	Parallel Sessions		12.1	2.3	7.1	3.1 (FU-1)	
17:40			END				
18:00			Welcome Reception and Poster Session				

Tue, July 12			Auditorium	Room 2006	Room 3028	FU	FU
9:00 – 10:00	Plenary Talk		Stephen Watt				
10:00 – 10:30	Break		Break				
10:30 – 12:10	Parallel Sessions		12.2	17.1	7.2	4.1 (FU-2)	
12:10 – 13:30	Lunch		Lunch				
13:00 – 13:30	Registration		Registration				
13:30 – 14:20			Tutorial/Demo/Poster				
14:20 – 16:00	Parallel Sessions		12.3	14.1	13.1		
16:00 – 16:20	Break		Break				
16:20 – 18:00	Parallel Sessions		12.4	6.1	13.2	3.2 (FU-4)	16.1 (FU-3)
18:00			END				

Wed, July 13			Auditorium	Room 2006	Room 3028	FU	FU
9:00 – 10:00	Plenary Talk		Wolfram Decker				
10:00 – 10:30	Break		Break				
10:30 – 12:10	Parallel Sessions		10.1	6.2	13.3		
12:10 – 13:30	Lunch		Lunch				
13:00 – 13:30	Registration		Registration				
13:30 – 14:20			Tutorial/Demo/Poster				
14:20 – 16:00	Parallel Sessions		1.1	14.2	8.1		
16:00 – 16:20	Break		Break				
16:20 – 18:00	Parallel Sessions		1.2	4.2	8.2	16.2 (FU-5)	
18:00			END				
18:20			Bus transfer from ZIB to TV tower (Alexanderplatz)				
19:30			Social Dinner				

Thu, July 14			Auditorium	Room 2006	Room 3028	FU	FU
9:00 – 10:00	Plenary Talk		Vladimir Voevodsky				
10:00 – 10:30	Break		Break				
10:30 – 12:10	Parallel Sessions		1.3	9.1	17.2	16.3 (FU-4)	
12:10 – 13:10	Lunch		Lunch				
13:10 – 14:50	Parallel Sessions		1.4	9.2	15.1		
14:50 – 15:00	Break		Break				
15:00 – 16:15	Parallel Sessions		10.2	9.3	15.2		
16:15			Closing				
16:30			Excursion				

Detailed Program

Plenary talks	Auditorium	
Mon 9:30-10:30	Jack Dongarra	With Extreme Scale Computing the Rules Have Changed
Tue 9:00-10:00	Stephen M. Watt	Toward an International Mathematical Knowledge Base
Wed 9:00-10:00	Wolfram Decker	Current Challenges in the Development of Open Source Computer Algebra Software
Thu 9:00-10:00	Vladimir Voevodsky	UniMath - a library of mathematics formalized in the univalent style

Session 1 Univalent Foundations and Proof Assistants

Session 1.1	Wednesday, July 13, 14:20-16:00, Auditorium	
14:20-14:55	Marc Bezem	A taxonomy of mathematical mistakes
14:55-15:30	Abhishek Anand	Exploiting uniformity in substitution: the Nuprl term model
15:30-16:00	Vincent Rahli	Exercising Nuprl's Open-Endedness

Session 1.2	Wednesday, July 13, 16:20-18:00, Auditorium	
16:20-16:55	Thorsten Altenkirch	A Cubical Type Theory
16:55-17:30	Mark Bickford	A model of Cubical Type Theory in Nuprl
17:30-18:00	Anders Mortberg	Cubical Type Theory

Session 1.3	Thursday, July 14, 10:30-12:10, Auditorium	
10:30-11:05	Matthieu Sozeau	Coq for Univalent Foundations
11:05-11:40	Benedikt Ahrens	Inductive sets in UniMath
11:40-12:10	Jason Gross	The HoTT/HoTT Library in Coq: Designing for Speed

Session 1.4	Thursday, July 14, 13:10-14:50, Auditorium	
13:10-13:35	Guillaume Brunerie	Custom definitional equalities in Agda
13:35-14:00	Catherine Lelay	A construction of real numbers in UniMath
14:00-14:25	Floris van Doorn	The Lean HoTT library
14:25-14:50	Jacob von Raumer	Formalizing Double Groupoids and Cross Modules in the Lean Theorem Prover

Session 2 Software for Mathematical Reasoning and Applications

Session 2.1	Monday, July 11, 11:00-12:40, Auditorium	
11:00-11:05	Wolfgang Windsteiger	Opening and General Structure of the Workshop
11:05-11:35	Christoph Benzmüller	Automating Free Logic in HOL
11:35-12:05	Alexander Steen	Agent-Based HOL Reasoning
12:10-12:40	Alexander Maletzky	Interactive Proving, Higher-Order Rewriting, and Theory Analysis in Theorema 2.0

Session 2.2	Monday, July 11, 14:00-15:40, Auditorium	
14:00-14:30	Yang Zhang	Automated Deduction in Ring Theory
14:35-15:05	Francisco Botana	Automated discovery of elementary geometry theorems: First steps
15:10-15:40	Alexei Lisitsa	Efficient knot discrimination via quandle colouring with SAT and #-SAT

Session 2.3	Monday, July 11, 16:00-17:40, Room 2006	
16:00-16:30	Renaud Rioboo	Certifying efficient polynomial implementations using the FoCaLize system
16:35-17:05	Yuan Zhou	Parameter space analysis for algebraic Python programs in SageMath
17:10-17:40	Akira Terui	An automated deduction and its implementation for solving problem of sequence at university entrance examination

Session 3 Computational Number Theory meets computational Algebraic Geometry

Session 3.1	Monday, July 11, 16:00-17:40, FU-1: Room SR 031, Arnimallee 6	
16:00-16-50	Andreas Steenpass	Gröbner Bases over Algebraic Number Fields
16:50-17:40	Hans Schoenemann	Extending Singular with new types and algorithms

Session 3.2	Tuesday, July 12, 16:20-18:00, FU-4: Room SR 032, Arnimallee 6	
16:20-17:10	Janko Boehm	Modular Methods in Computational Algebraic Geometry
17:10-18:00	Anne Fruehbis-Krueger	Algorithmic resolution of singularities

Session 4 — Algebraic Geometry in Applications

Session 4.1 — Tuesday, July 12, 10:30-12:10, FU-2: Room SR 025/026, Arnimallee 6

Time	Speaker	Title
10:30-11:05	Fatemeh Mohammadi	Combinatorial and geometric view of the system reliability theory
11:05-11:40	Laurent Evain	Calibration of accelerometers and the geometry of quadrics
11:40-12:10	Jonathan Hauenstein	Decomposing solution sets of polynomial systems using derivatives

Session 4.2 — Wednesday, July 13, 16:20-18:00, Room 2006

Time	Speaker	Title
16:20-16:55	Tomas Pajdla	Computational Algebraic Geometry in 3D Computer Vision
16:55-17:30	Viktor Levandovskyy	A commutative approach to the Bernstein data of a hypersurface
17:30-1800	Thomas Kahle	Semi-algebraic geometry of Poisson regression

Session 5 — Computational aspects of homological algebra, group, and representation theory

Session 5.1 — Monday, July 11, 11:00-12:40, Room 3028

Time	Speaker	Title
11:00-11:50	David Green	Group cohomology and efficient methods for group algebras of large p-groups
11:50-12:40	Caroline Lassueur	Endo-p-permutation modules: a computational approach via character theory

Session 5.2 — Monday, July 11, 14:00-15:40, Room 3028

Time	Speaker	Title
14:00-14:40	Sebastian Posur	Constructing morphisms by diagram chases
14:50-15:40	Øyvind Solberg	Test for infinite projective dimension

Session 6 — Software of Polynomial Systems

Session 6.1 — Tuesday, July 12, 16:20-18:00, Room 2006

Time	Speaker	Title
16:20-16:45	Davenport, England	Need Polynomial Systems be Doubly-exponential?
16:45-17:10	Bigatti, Abbott, Robbiano	New, Practical Algorithms for Implicitization of Hypersurfaces
17:10-17:35	John Abbott	Fault-Tolerant Rational Reconstruction Applied to Implicitization of Hypersurfaces
17:35-18:00	Yinping Liu, Ruoxia Yao, Zhibin Li, Le Yang, Xiaoyan Tang	NDEmathema: An Innovative Web-based Automated Symbolic Computing Platform for Nonlinear Differential Equations

Session 6.2 — Wednesday, July 13, 10:30-12:10, Room 2006

Time	Speaker	Title
10:30-10:55	Eder, Faugere	GBLA - A Groebner Basis Linear Algebra Package
10:55-11:20	Fukasaku, Iwane, Sato	On the Implementation of CGS Real QE
11:20-11:45	Wang, Mou, Dong	Epsilon 1: A Software Library for Triangular Decomposition
11:45-12:10	Heinz Kredel	Common Divisors of Solvable Polynomials in JAS

Session 7 — Software for the Symbolic Study of Functional Equations

Session 7.1 — Monday, July 11, 16:00-17:40, Room 3028

Time	Speaker	Title
16:00-16:30	Suzy Maddah	Overview talk
16:35-17:05	Thomas Cluzeau	Algorithms and related Maple packages for integrable connections and planar polynomial vector fields
17:10-17:40	Jamal Hossein Poor	Normal forms for operators via Gröbner bases in tensor algebras

Session 7.2 — Tuesday, July 12, 10:30-12:10, Room 3028

Time	Speaker	Title
10:30-11:00	Albert Heinle	Factoring Elements in G-Algebras with 'ncfactor.lib'
11:05-11:35	Viktor Levandovskyy	Algorithms for systems of linear functional equations and their implementation in Singular
11:40-12:10	Cluzeau, Koutschan	Effective algebraic analysis approach to linear systems over Ore algebras

Session 8	Symbolic Integration

Session 8.1	Wednesday, July 13, 14:20-16:00, Room 3028	
14:20-14:30	Christoph Koutschan	Session Opening and Overview
14:30-15:00	Clemens G. Raab	Computer algebra tools for integrals
15:00-15:30	Roche, May	A Discussion of the Practical Issues of Computing Integrals in Maple
15:30-16:00	Jeffrey, Rich	Recent Developments in the RUBI Integration Project

Session 8.2	Wednesday, July 13, 16:20-18:00, Room 3028	
16:20-16:50	James H. Davenport	Complexity of Integration, Special Values, and Recent Developments
16:50-17:20	Waldek Hebisch	Integration in terms of exponential integrals and incomplete gamma functions
17:20-18:00	Lin Jiu	The Method of Brackets

Session 9	Symbolic computation and elementary particle physics

Session 9.1	Thursday, July 14, 10:30-12:10, Room 2006	
10:30-11:00	Johannes Blümlein	The mathematical function spaces of higher loop Feynman integrals
11:05-11:35	Andreas v. Manteuffel	Reducing Feynman integrals with finite fields
11:40-12:10	Abilio De Freitas	Three-loop heavy flavor corrections to DIS structure functions

Session 9.2	Thursday, July 14, 13.10-14:50, Room 2006	
13:10-13:40	Stefan Weinzierl	Algorithms for all-order expansions
13:40-14:10	Mark Round	Summation techniques for Feynman diagrams via special functions
14:10-14:50	Erik Panzer	Conical sums and multiple polylogarithms

Session 9.3	Thursday, July 14, 15:00-16:15, Room 2006	
15:00-15:30	Dirk Kreimer	Motivating computational practice
15:30-16:00	Christian Bogner	MPL - a program for computations with multiple polylogarithms
16:00-16:15	Carsten Schneider	Symbolic summation packages for elementary particle physics

Session 10	Software for numerically solving polynomial systems

Session 10.1	Wednesday, July 13, 10:30-12:10, Auditorium	
10:30-11:00	Hans Schoenemann	Primary decomposition in Singular
11:05-11:35	Anders Jensen	An implementation of exact mixed volume computation
11:40-12:10	Miguel Marco	SIROCCO: a library for certified polynomial root continuation

Session 10.2	Thursday, July 14, 15:00-16:15, Auditorium	
15:00-15:30	Daniel Brake	Numerically decomposing complex and real tropical curves in any number of dimensions
15:40-16:10	Bernard Mourrain	Border basis for polynomial system solving and optimization

Session 11	High-precision arithmetic, effective analysis and special functions

Session 11.1	Monday, July 11, 11:00-12:40, Room 2006	
11:00-11:10	Fredrik Johansson	Special functions and interval arithmetic
11:10-11:40	Navas-Palencia, Arratia	On the computation of confluent hypergeometric functions for large imaginary part of b and z
11:40-12:10	Marc Mezzarobba	Rigorous Multiple-Precision Evaluation of D-Finite Functions in Sage
12:10-12:40	Pascal Molin	L functions in Pari/GP

Session 11.2	Monday, July 11, 14:00-15:40, Room 2006	
14:00-14:25	Elias Tsigaridas	Real root isolation in FLINT
14:25-14:50	Breust, Chabot, Dumas, Fousse, Giorgi	Recursive double-size fixed precision arithmetic
14:50-15:15	Joldes, Muller, Popescu, Tucker	CAMPARY: Cuda Multiple Precision Arithmetic Library and Applications
15:15-15:40	Rodriguez, Abad, Barrio, Marco-Buzunariz	Automatic implementation of the numerical Taylor series method

Session 12 — Mathematical Optimization

Session 12.1 — Monday, July 11, 16:00-17:40, Auditorium

Time	Speaker	Title
16:00-16:20	Horand I. Gassmann	Recent developments in Optimization Services (OS)
16:20-16:40	Mike Steglich	CMPL (<Coliop|Coi> Mathematical Programming Language)
16:40-17:00	Matthias Miltenberger	PySCIPOpt: Mathematical Programming in Python with the SCIP Optimization Suite
17:00-17:20	Shahadat Hossain	DSJM: A Software Toolkit for Direct Determination of Sparse Jacobian Matrices
17:20-17:40	Andrew Mason	SolverStudio and OpenSolver: Excel Tools for Bringing Advanced Optimisation to the Masses

Session 12.2 — Tuesday, July 12, 10:30-12:10, Auditorium

Time	Speaker	Title
10:30-10:50	J.A. Julian Hall	Parallel distributed-memory simplex for large-scale stochastic LP problems
10:50-11:10	Timo Berthold	Parallelization of the FICO Xpress Optimizer
11:10-11:30	Yuji Shinano	A First Implementation of ParaXpress: Combining Internal and External Parallelization on Supercomputers
11:30-11:50	Nowak, Breitfeld	pyADCG: A preliminary implementation of a new parallel solver for nonconvex MINLPs in Pyomo/Python
11:50-12:10	Katsuki Fujisawa	Advanced Computing&Optimization Infrastructure for Extremely Large-Scale Graphs on Post Peta-Scale Supercomputers

Session 12.3 — Tuesday, July 12, 14:20-16:00, Auditorium

Time	Speaker	Title
14:20-14:40	Keiji Kimura	Mixed Integer Nonlinear Programming for Minimization of Akaike's Information Criterion
14:40-15:00	Tristan Gally	SCIP-SDP: A Framework for Solving Mixed-Integer Semidefinite Programs
15:00-15:20	Angelika Wiegele	Improving BiqMac: stronger semidefinite relaxations for solving binary quadratic problems
15:20-15:40	Matthias Köppe	Software for cut generating functions in the Gomory-Johnson model and beyond
15:40-16:00	Sebastian Schenker	PolySCIP, a solver for multi-objective MIPs

Session 12.4 — Tuesday, July 12, 16:20-18:00, Auditorium

Time	Speaker	Title
16:20-16:40	Adolfo R. Escobedo	Efficient Validation of Basic Solutions via the Roundoff-Error-Free Factorization Framework
16:40-17:00	Tobias Weber	High-Precision Quadratic Programming by Iterative Refinement
17:00-17:20	Andreas Meyer	Global error control for Optimal Control problems
17:20-17:40	Rafael Arndt	On Solution Algorithms for Time-Dependent Quasi-Variational Inequalities with Gradient Constraints
17:40-18:00	Felix Lenders	Solving the Trust-Region Subproblem using Krylov subspace methods

Session 13 — Interactive operation to scientific artwork and mathematical reasoning

Session 13.1 — Tuesday, July 12, 14:20-16:00, Room 3028

Time	Speaker	Title
14:20-15:00	S. Takato	What is and How to use KeTCindy –- Linkage between Dynamic Geometry Software and TeX graphics capabilities
15:00-15:20	S. Yamashita	The Programming Style for Drawings from KeTpic to KeTCindy
15:20-15:40	S. Kobayashi, S. Takato	Cooperation of KeTCindy and Computer Algebra System
15:40-16:00	H. Usui	How to generate figures at the preferred position of a TeX document

Session 13.2 — Tuesday, July 12, 16:20-18:00, Room 3028

Time	Speaker	Title
16:20-16:45	N. Hamaguchi, S. Takato	Generating data for 3D models
16:45-17:10	H. Sarafian	Theoretical Physics, Applied Mathematics and Visualizations
17:10-17:35	Y. Nakamura, T. Nakahara	Function Enhancement of Math Input Environment with Flick Operation for Mobile Devices
17:35-18:00	F. Iwama, T. Takahashi	A Framework for Exploring Inference Processes using Reasoning Software

Session 13.3 — Wednesday, July 13, 10:30-12:10, Room 3028

Time	Speaker	Title
10:30-10:55	von Gagern, Kortenkamp, Richter-Gebert, Strobel	CindyJS --- Mathematical visualization on modern devices
10:55-11:20	von Gagern, Richter-Gebert	CindyJS Plugins --- Extending the mathematical visualization framework
11:20-11:45	Montag, Richter-Gebert	CindyGL: Authoring GPU-based interactive mathematical content
11:45-12:10	Kaneko	The actual use of KeTCindy in education

Session 14 — Information services for mathematics: software, services, models, and data

Session 14.1 — Tuesday, July 12, 14:20-16:00, Room 2006

Time	Speaker	Title
14.20 -14.40	Wolfram Sperber	Information services for mathematical research data
14.40 -15-00	Yue Ren	The software portal swMATH: a state of the art report and next steps
15.00 -15.30	Mila Runnwerth	Linking Mathematical Software in Web Archive
15.30 -16.00	Michael Joswig	The polymake XML file format

Session 14.2 — Wednesday, July 13, 14:20-16:00, Room 2006

Time	Speaker	Title
14.20-15.00	Michael Kohlhase	Distributed Computing via the Math-in-the-Middle Paradigm in OpenDreamKit
15.00-15.30	Hans-Gert Gräbe	Semantic-aware Fingerprints of symbolic research data
15:30-16:00	Karsten Tabelow	Mathematical models: a research data category?

Session 15 — Towards a Semantic Layer of a World Digital Mathematical Library

Session 15.1 — Thursday, July 14, 13:10-14:50, Room 3028

Time	Speaker	Title
13:10-13:35	Patrick D. F. Ion	The Effort to Realize a Global Digital Mathematics Library
13:35-14:00	Bruno Buchberger	The GDML and EuKIM Projects: Short Report on the Initiative
14:00-14:25	Mila Runnwerth	Mathematical videos and affiliated supplementaries in TIB's AV Portal
14:25-14:50	Chebukov, Izaak, Misyurina, Pupyrev	Math-Net.Ru Video Library: creating a collection of scientific talks

Session 15.2 — Thursday, July 14, 15:00-16:15, Room 3028

Time	Speaker	Title
15:00-15:25	Bruno Buchberger	Stam's Identities Collection: A Case Study for Math Knowledge Bases
15:25-15:50	Enxhell Luzhnica, Michael Kohlhase	Formula Semantification and Automated Relation Finding in the Open Encyclopedia for Integer Sequences
15:50-16:15	Ginev, Iancu, Jucovshi, A. Kohlhase, M. Kohlhase, Schefter, Sperber, Teschke	The SMGloM Project and System

Session 16 — Polyhedral methods in geometry and optimization

Session 16.1 — Tuesday, July 12, 16:20-18:00, FU-3: Room 046, Takustraße 9

Time	Speaker	Title
16:20-16:50	Anders N. Jensen, Yue Ren	Tropical dimension bounds for monomial-free ideals
16:55-17:25	Simon Hampe	Tropical computations in polymake
17:30-18:00	Benjamin Burton	Multiobjective integer linear programming by tropical convexity

Session 16.2 — Wednesday, July 13, 16:20-18:00, FU-5: Room SR 005, Takustraße 9

Time	Speaker	Title
16:20-16:45	Lars Kastner	Toric geometry in polymake
16:45-17:10	Bastrakov, Zolotykh	qskeleton: parallel polyhedral computing software based on the double description method and Fourier-Motzkin elimination
17:10-17:35	Matthias Köppe	Sage flavored LattE integrale
17:35-18:00	Max Demenkov	Linear programming using line and zonotope intersection

Session 16.3 — Thursday, July 14, 10:30-12:10, FU-4: Room SR 032, Arnimallee 6

Time	Speaker	Title
10:30-11:00	Kaibel, Walter	Investigating Polyhedra by Oracles
11:05-11:35	Hojny, Pfetsch	Symmetry Handling in Binary Programs via Polyhedral Methods
11:40-12:10	Bruns, Söger, Sieg	The subdivision of large simplicial cones in Normaliz

Session 17 — General

Session 17.1 — Tuesday, July 12, 10:30-12:10, Room 2006

Time	Speaker	Title
10:30-10:55	Antoine Plet et al.	A Library for Symbolic Floating-Point Arithmetic
10::55-11:20	Joerg Fehr et al.	A Guide for Good Scientific Practice in Numerical Experiments
11:20-11:45	Mokwon Lee et al.	Robust construction of the additively-weighted Voronoi diagram via topology-oriented incremental algorithm
11:45-12:10	Laurent Evain	The Pycao Software (handling 3D objects…)

Session 17.2 — Thursday, July 14, 10:30-12:10, Room 3028

Time	Speaker	Title
10:30-10:55	Yuri M. Movsisyan	Bilattices of bi-De Morgan Functions
10::55-11:20	Luigi Di Puglia Pugliese	An algorithm to find the Link Constrained Steiner Tree in Undirected Graph
11:20-11:45	Bahram Alidaee	Meta-Heuristic for Large-Scale Unrelated Parallel Machine Scheduling
11:45-12:10	Joris van der Hoeven	Mathematical Font Art

Session 18	Tutorials

Session 18.1	Tuesday, July 12, 13:30-14:15, Auditorium	
13:30-14:15	Anna Maria Bigatti	CoCoALib and CoCoA-5

Session 18.2	Wednesday, July 13, 13:30-14:15, Auditorium	
13:30-14:15	Sebastian Gutsche	Docker images for mathematical software

Session 19	Demos

Session 19.1	Tuesday, July 12, 13:30-14:20, Room 2006	
13:30-13:55	Joris van der Hoeven	GNU TeXmacs
13:55-14:20	Simon Hampe	Polymake 3.0

Session 19.2	Wednesday, July 13, 13:30-14:20, Room 2006	
13:30-13:55	A. John, A.-M.Bigatti	CoCoALib and CoCoA-5
13:55-14:20	Hisashi Usui	KeTCindy

Session 20	Posters

Session 20.1	Monday, July 11, 18:00, Foyer

Session 20.1	Tuesday, July 12, 13:30-14:15, Foyer	
13:45-14:15	Abraham, Abbott, et. all.	Satisfiability Checking and Symbolic Computation
13:45-14:15	Benzmüller, Woltzenlogel Paleo	The Inconsistency in Gödel's Ontological Argument: A Success Story for Automated Theorem Proving in Metaphysics
13:45-14:15	Anna Maria Bigatti	CoCoALib and CoCoA-5
13:45-14:15	Max Demenkov	Zonotopes and explicit linear programming

Session 20.1	Wednesday, July 13, 13:30-14:15, Foyer	
13:45-14:15	Abraham, Abbott, et. all.	Satisfiability Checking and Symbolic Computation
13:45-14:15	Benzmüller, Woltzenlogel Paleo	The Inconsistency in Gödel's Ontological Argument: A Success Story for Automated Theorem Proving in Metaphysics
13:45-14:15	Anna Maria Bigatti	CoCoALib and CoCoA-5
13:45-14:15	Max Demenkov	Zonotopes and explicit linear programming