

SECOND ANNUAL

CROPS IN SILICO

SYMPOSIUM AND WORKSHOP

June 26-28th 2017
St Catherine's College
University of Oxford, UK

cropsinsilico.org





St. Catherine's College

Meeting lodging
check-in
after 2pm, check
out by 10am

Porters' Lodge

Car Parks

Punt House

Maintenance & Laundry

Mary Sunley Building

Main Gate

Alan Bullock Building

JCR

Kitchen

SCR

College Offices

SCR

Dining Hall

All meals

Quad

Wolfson Library

Bell Tower

Bernard Sunley Building

Conference
Registration
Main Lecture
Theatre
Rooms B, C, D
Evening
Reception

Squash Courts & Gym

Bicycle Shed

Master's Lodgings

Water

Garden

Music House

River Cherwell

Welcome to the Second Annual Crops *in silico* Symposium and Workshop.

The first Symposium and Workshop held in 2016 at the University of Illinois and National Center for Supercomputing Applications identified major challenges involved both in the development and deployment of a shared, multi-scale modeling platform. Solutions drew in particular on the experience and successes of other communities.

The goals of this Symposium and Workshop are:

- Briefly introduce the Crops *in silico* concept as an integrative and multi-scale modeling platform.
- Learn from plant and computer scientists who have progressed plant modeling or tools to enhance modeling in different domains.
- Discuss where sustainable and practical collaborations may be valuable and achievable in bridging layers of organization.
- Map the next steps for the community

We ask that whether you are speaker, poster presenter or participant you be prepared to be actively involved in the discussions that will be designed to bring us to clear conclusions and action points for completion over the next 12 months.

Thank you for joining us.

Logistics

Symposium Location: The Symposium will be held at The Bernard Sunley Building auditorium at St Catherine's College.

Lodging: Those staying on location will be housed at Porters' Lodge at St. Catherine's College. Please note that check-in is any time after 2pm on the day of arrival and check out is any time before 10am on the day of departure. Guests are welcome to store any luggage or belongings in the storage area at the Porters Lodge which is open and manned 24/7.

Meals: Breakfast, lunch and dinner during the Symposium will be provided. These will be served in the St. Catherine's College Dining Hall.

Internet Access: Available via 'The Cloud' free Wi-Fi system:

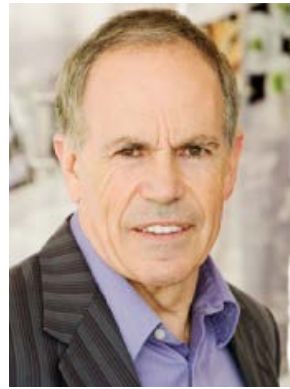
1. Select 'The Cloud' from available network list
2. Open browser and follow on screen instructions
3. Once registered you will seamlessly connect to The Cloud WiFi without needing to re-enter username and password

Organizers



Steve Kelly

Department of Plant Sciences,
University of Oxford



Steve Long

Departments of Plant Biology
and Crop Sciences, University
of Illinois; Department of Plant
Sciences, University of Oxford



Amy Marshall-Colón

Department of Plant Biology,
University of Illinois



Rachel Shekar

Carl R. Woese Institute for
Genomic Biology, University
of Illinois

Keynote Speaker: **Eberhard Voit**

Professor and GRA
Eminent Scholar
Flanagan Chair in
Biological Systems
Georgia Institute of Technology



Monday, 26 June at the Bernard Sunley Lecture Theatre

| | | |
|---------|---|--------|
| 4:45 pm | Registration | Foyer |
| | Poster setup | Room A |
| 5:00 pm | Welcome – Steve Long, University of Illinois and University of Oxford | |
| 5:15 pm | Keynote Talk: Templates, anchors and matryoshkas: A vision for crop systems biology - Eberhard Voit | |
| 6:15 pm | Reception | Foyer |
| 7:00 pm | Dinner | Hall |

Tuesday, 27 June

| | | |
|---------|---|-------|
| 8:00 am | Breakfast | Hall |
| 9:00 am | Registration | Foyer |
| 9:30 am | Welcome and Introduction, recap of 2016 meeting and white paper – Steve Long, University of Illinois and University of Oxford | |

Session 1: Recent developments in plant modelling

| | | |
|---------|--|-------|
| 9:45 am | Introduction to session | |
| | Cassava source-sink – Expression of genes involved in central carbon metabolism - Frank Ludewig, Universität Erlangen-Nürnberg | |
| | Constraints-based modelling of leaf metabolic networks - Lee Sweetlove, University of Oxford | |
| | Signal integration in the control of shoot branching - Ottoline Leyser, Cambridge University | |
| | Discussion | * |
| | Break: coffee | Foyer |
| | Organ scale models: lessons from the hidden half - Malcolm Bennett, University of Nottingham | |
| | Crop modelling to underpin food security - Matt Reynolds, CGIAR | |
| | Discussion | * |

| | | |
|----------|----------------|--------|
| 12:50 pm | Break lunch | Hall |
| 1:35 pm | Poster session | Room A |

Session 2: Recent developments in model integration

| | | |
|---------|--|-------|
| 2:35 pm | Introduction to session | |
| | Development and use of advanced cyberinfrastructure – Daniel S. Katz, University of Illinois | |
| | Approaches for multi-scale modeling – Cranos Williams, North Carolina State University | |
| | A computational framework for connecting models across languages and scales – Meagan Lang, National Center for Supercomputing Applications | |
| | Introduction of additional panelists | |
| | Panel discussion | |
| 4:35 pm | Break tea | Foyer |
| 4:50 pm | Concluding remarks | Foyer |
| 5:00 pm | Free time | |
| 7:00 pm | Conference dinner | Hall |

Wednesday, 28 June

8:00 am Breakfast Hall

9:15 am Introduction for day 3

Session 3: Users and usability

9:30 am Introduction to session
Data visualization - Min Chen, University of Oxford
Enhancing usability - Brian Carlson, SemGen
Discussion *

Break: coffee Foyer

Education – Gabrielle Allen, University of Illinois
Scaling from mechanistic models to crop stands: The experience in photosynthesis – Steve Long, University of Illinois and University of Oxford
Discussion *

Identifying users and opportunities to enhance usability TBD

12:50 pm Break lunch Hall

Session 4: Next steps for Crops *in silico*

1:50 pm Introduction to session TBD
Identifying a Grand Challenge

4:45 pm Concluding remarks – Steve Long, University of Illinois and University of Oxford

* Discussions will take place in the Theatre, Room C, and Room D

Speakers



Gabrielle D. Allen

Professor of Astronomy and Associate Dean
for Research and Research Education,
University of Illinois



Min Chen

Professor of Scientific Visualization, Oxford
University



Malcolm Bennett

Professor of Plant Sciences, The University
of Nottingham



Daniel S. Katz

Assistant Director for Scientific Software and
Applications, National Center for
Supercomputing Applications & Research
Associate Professor, Electrical and
Computer Engineering & Computer Science,
University of Illinois



Brian Carlson

Research Assistant Professor, Molecular &
Integrative Physiology, University of
Michigan



Meagan Lang

Postdoctoral Research Associate in the
National Center for Supercomputing
Applications at the University of Illinois



Matt Reynolds

Wheat Physiologist, CGIAR and International
Maize and Wheat Improvement Center



Ottoline Leyser

Director of the the Sainsbury Laboratory,
Cambridge University



Lee Sweetlove

Professor of Plant Sciences, University of
Oxford



Frank Ludewig

Scientific coordinator of the Cassava
Source-Sink project, Universität Erlangen-
Nürnberg



Cranos M. Williams

Director of the EnBiSys Research Laboratory
and Assistant Professor of Electrical and
Computer Engineering at North Carolina
State University

Attendees

Basel Abu-Jamous *

University of Oxford
basel.abujamous@plants.ox.ac.uk

Gabrielle Allen

NCSA and University of Illinois
gdallen@illinois.edu

Malcolm Bennett

The University of Nottingham
malcolm.bennett@nottingham.ac.uk

Thomas Braam

University of Oxford
thomas.braam@plants.ox.ac.uk

David Brown

X
drbrown@google.com

Victor Caldas

Vrije Universiteit Amsterdam
v.arminicaldas@vu.nl

Brian Carlson

University of Michigan
bcarl@med.umich.edu

Min Chen

University of Oxford
min.chen@oerc.ox.ac.uk

Girish Chowdhary *

University of Illinois
girishc@illinois.edu

AJ Christensen *

NCSA and University of Illinois
achrist3@illinois.edu

Rona Costello

University of Oxford
rona.costello@plants.ox.ac.uk

Valentin Couvreur *

Catholic University of Leuven
valentin.couvreur@uclouvain.be

Zhanwu Dai *

French National Institute for Agricultural
Research
zhanwu.dai@inra.fr

Alyssa Ferris

Stanford University
Alyssa.Ferris@gatesfoundation.org

Ursula Flores-Perez

University of Oxford
ursula.flores-perez@plants.ox.ac.uk

Christian Fournier

French National Institute for Agricultural
Research
christian.fournier@inra.fr

Mark Fricker

University of Oxford
mark.fricker@plants.ox.ac.uk

Nick Harberd

University of Oxford
nicholas.harberd@plants.ox.ac.uk

Ross Hendron

University of Oxford
ross-william.hendron@pmb.ox.ac.uk

Peter Hirst *

Purdue University
hirst@purdue.edu

Steve Humphries

Essex University
Steven.Humphries@enservegroup.com

Kavya Kannan *

University of Illinois
kkannan2@illinois.edu

Daniel S. Katz *

NCSA and University of Illinois
dskatz@illinois.edu

David Katzin *

Wageningen University & Research
david.katzin@wur.nl

Steve Kelly

University of Oxford
steven.kelly@plants.ox.ac.uk

Wanne Kromdijk *

University of Illinois
wannekromdijk@googlemail.com

Nicholas Kruger

University of Oxford
nick.kruger@plants.ox.ac.uk

Lambret-Frotté

University of Oxford
lambret.julia@gmail.com

Meagan Lang

NCSA and University of Illinois
langmm.astro@gmail.com

Andrew Leakey *

University of Illinois
andrewleakey77@gmail.com

David LeBauer *

University of Illinois
dlebauer@illinois.edu

Ottoline Leyser

University of Cambridge
ol235@cam.ac.uk

Frank Ludewig

Universität Erlangen-Nürnberg
frank.ludewig@fau.de

Francisco Mondaca Durate *

Wageningen University & Research
francisco.mondacaduarte@wur.nl

Alejandro Morales *

Wageningen University & Research
alejandro.moralessierra@wur.nl

Michael Niklaus

University of Oxford
michael.niklaus@lincoln.ox.ac.uk

Johannes Postma

Jülich Research Centre
j.postma@fz-juelich.de

Christophe Pradal

CIRAD
christophe.pradal@cirad.fr

George Ratcliffe

University of Oxford
george.ratcliffe@plants.ox.ac.uk

John Reich

Foundation for Food and Agriculture
Research
jreich@foundationfar.org

Matt Reynolds

CGIAR and International Maize and Wheat
Improvement Center
m.reynolds@cgiar.org

Sally Rockey

Foundation for Food and Agriculture
Research
hgalante@foundationfar.org

Ernst Schafer

The University of Nottingham
ernst.schafer@nottingham.ac.uk

Edward Seidel

University of Illinois
eseidel@uillinois.edu

Sanu Shameer

University of Oxford
sanu.shameer@plants.ox.ac.uk

Rachel Shekar

University of Illinois
shekar@illinois.edu

Steve Long

University of Illinois & University of Oxford
slong@illinois.edu

Lee Sweetlove

University of Oxford
lee.sweetlove@plants.ox.ac.uk

Simon van Mourik *

Wageningen University & Research
simon.vanmourik@wur.nl

Eberhard Voit

Georgia Tech University
eberhard.voit@bme.gatech.edu

Peng Wang

University of Oxford
peng.wang@plants.ox.ac.uk

Yu Wang *

University of Illinois
yuwangcn@illinois.edu

Heidi Webber

University of Bonn
hwebber@uni-bonn.de

Cranos Williams

North Carolina State University
cmwilli5@ncsu.edu

Yi Xiao *

CAS-MPG Partner Institute for Computational
Biology
xiaoyi@picb.ac.cn

Xinguang Zhu

CAS-MPG Partner Institute for Computational
Biology
zhuxinguang@picb.ac.cn

* indicates poster presented

Second Annual Crops *in silico* Symposium and Workshop sponsors.

