

Welcome to



# *Inverted* CERN School of Computing 2018

5-8 March - CERN IT Amphitheatre

<http://indico.cern.ch/e/iCSC-2018>

*Sebastian Lopienski*

*CERN School of Computing director*

# Three CERN Schools of Computing

## CSC 2018



**Main school**

**1 Oct - 14 Oct 2018**

[Tel Aviv University](#) | Tel Aviv | Israel

*Applications will open in March 2018*

## tCSC 2018



**Thematic school**

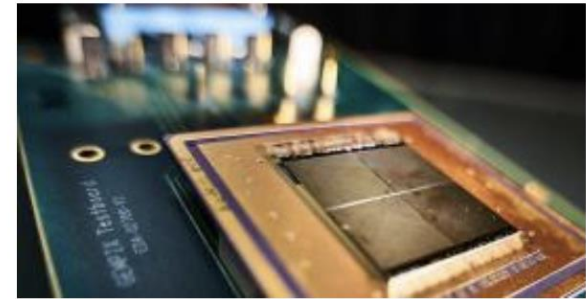
**3 Jun - 9 Jun 2018**

[MEDILS](#) | Split | Croatia

[School Website](#)

**APPLY NOW!**

## iCSC 2018



**Inverted school**

**5 Mar - 8 Mar 2018**

[CERN](#) | Geneva | Switzerland

[School Website](#)

*register*

- ✓ Have you ever heard of **Enterprise Computing**, is it relevant to physics computing?
- ✓ Do you know what **Design Pattern** is?
- ✓ Are you sure the software you write has no **security holes**?
- ✓ Are you sure that you know and master **modern debugging** tools?
- ✓ Do you know how to design (effectively) a **database schema**?
- ✓ What is the secret to writing an efficient **SQL** query?
- ✓ What is database **performance tuning**, why is it perceived as magic and how to tame it?
- ✓ Do you know how to read an **execution plan**?
- ✓ How does **Google** News work?
- ✓ Do you know, in practice how to expose your application as a **Web Service**?
- ✓ Are you sure your Web Services are **secure**?

All the answers at ICSC

iCSC  
CERN  
School of Computing

**inverted** CSC-2005

"Where students turn into teachers"



23-25 February 2005, CERN\*

- ▶ Data Management and Data Bases
- ▶ Advanced Software Development and Engineering
- ▶ Web Services in Distributed Computing

- a novel idea prototyped in 2005
- a three-day series of lectures proposed and delivered by selected students
- advanced topics, rarely taught at CERN before

Lecturers - all former CSC2004 students

|                            |                          |
|----------------------------|--------------------------|
| <b>Paolo Adragna</b>       | University of Siena      |
| <b>Miguel Anjo</b>         | CERN                     |
| <b>Ioannis Baltopoulos</b> | Imperial College         |
| <b>Gerhard Brandt</b>      | University of Heidelberg |
| <b>Giovanni Chierico</b>   | CERN                     |
| <b>Brice Copy</b>          | CERN,                    |
| <b>Michal Kwiatek</b>      | CERN                     |
| <b>Ruben Leivas Ledo</b>   | CERN                     |
| <b>Sebastian Lopienski</b> | CERN                     |
| <b>Petr Olmer</b>          | CERN                     |
| <b>Zornitsa Zaharieva</b>  | CERN                     |

"Where students turn into teachers"

Back in  
2005...



# iCSC lecturers becoming full CSC lecturers



- Sebastian Lopienski (*iCSC 2005*)
- Andrzej Nowak (*iCSC 2008*)
- Benjamin Radburn-Smith (*iCSC 2010*)
- Thomas Keck (*iCSC 2016*)
- Eamonn Maguire (*iCSC 2017*)

The logo for CERN iSC features a lowercase 'i' in red and 'SC' in a teal, stylized font. Below this, the text 'CERN School of Computing 2018' is displayed. 'CERN' is in bold black, 'School' is in black, 'of' is in teal, 'Computing' is in black, and '2018' is in bold red.

**CERN**  
School *of* Computing **2018**

# Inverted CSC 2018

We encouraged lecturers to propose hands-on exercises

Received **13 proposals of lectures and exercises** for a total of **43 (25+18) hours** by students from:

- CSC 2017 (*Madrid, Spain*)
- **t**CSC 2017 (*Split, Croatia*)
- CSC 2015 (*Kavala, Greece*)

**9 proposals** retained – **20 (13+7) hours**

**Exercises in 513-1-024  
Come with your laptop**

# Schedule

**Data Centre visit  
registration – see email**

<https://indico.cern.ch/event/671879/timetable/>

| Monday, 5 March 2018   | Tuesday, 6 March 2018  | Wednesday, 7 March 2018  | Thursday, 8 March 2018   |
|--|--|--|--|
|  | <b>08:30 Welcome coffee</b>  | <b>08:30 Welcome coffee</b>  |  |
|  | <b>09:00 Bayesian Data Analysis (lecture 1) - Christian Graf</b>                         | <b>09:00 Computing for Decentralized Systems (lecture 1) - Alejandro Avilés</b>                | <b>09:00 Computing for Decentralized Systems (lecture 2) - Alejandro Avilés</b>  |
|  | <b>10:00 Algorithms and Data Structures (lecture 2) - Lennaert Bel</b>                   | <b>10:00 K.I.S.S. Parallel Coding (lecture 1) - Gabriele Gaetano Fronze'</b>                   | <b>10:00 Coffee</b>  |
|  | <b>11:00 Coffee</b>  | <b>11:00 Coffee</b>  | <b>10:30 K.I.S.S. Parallel Coding (exercise 1) - Gabriele Gaetano Fronze'</b>    |
|  | <b>11:30 Speeding up image reconstruction in computed tomography - Victoria Tokareva</b> | <b>11:30 From sequential to parallel programming with patterns - Placido Fernandez Declara</b> | <b>11:30 K.I.S.S. Parallel Coding (exercise 2) - Gabriele Gaetano Fronze'</b>    |
|  | <b>12:30 Lunch break</b>   | <b>12:30 Lunch break</b>   | <b>12:30 Lunch break</b>   |
| <b>13:15 Welcome coffee</b>  |  |  |  |
| <b>13:45 A word from the IT Department Head</b>                        |  |  |  |
| <b>13:50 Introduction to the Inverted CSC</b>                          | <b>14:00 Bayesian Data Analysis (lecture 2) - Christian Graf</b>                         | <b>14:00 CERN Data Centre visit</b>  | <b>14:00 Computing for Decentralized Systems (exercise 1) - Alejandro Avilés</b> |
| <b>14:00 Algorithms and Data Structures (lecture 1) - Lennaert Bel</b> | <b>15:00 Securing Distributed Research - Hannah Short</b>                                | <b>15:00 Coffee</b>  | <b>15:00 Coffee</b>  |
| <b>15:00 Modern Backend Systems - Georgios Voulgarakis</b>             | <b>16:00 Coffee</b>  | <b>15:30 Algorithms and Data Structures (exercise 1) - Lennaert Bel</b>                        | <b>15:30 K.I.S.S. Parallel Coding (lecture 2) - Gabriele Gaetano Fronze'</b>     |
| <b>16:00 Coffee</b>  | <b>16:30 Securing Distributed Research (exercise) - Hannah Short</b>                     | <b>16:30 Algorithms and Data Structures (exercise 2) - Lennaert Bel</b>                        | <b>16:30 Closing remarks</b>   |
| <b>16:30 Modern Backend Systems (exercise) - Georgios Voulgarakis</b>  |  |  |  |



# Topics



Backend Systems



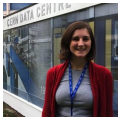
Blockchain and Decentralized Consensus



Complexity and Data Structures



Bayesian Data Analysis



Identity Federation



Medical Imaging



Parallel Programming with OpenMP



Parallel Programming Patterns

# Lecturers

<https://indico.cern.ch/event/671879/page/11702-speakers>



**Alejandro Avilés**  
*Bity SA*  
*(Switzerland)*



**Lennaert Bel**  
*Nikhef*  
*(Netherlands)*



**Plácido Fernández**  
*CERN, and*  
*University Carlos III*  
*of Madrid (Spain)*



**Gabriele Fronzé**  
*INFN Torino (IT),*  
*Subatech Nantes (FR)*



**Christian Graf**  
*Max Planck*  
*Institute (Germany)*



**Hannah Short**  
*CERN*



**Victoria Tokareva**  
*JINR (Russia)*



**Georgios Voulgarakis**  
*CERN*

# Conveners (session chairs)



Julio Calvo



Daniel Campora



Stefan Chitic



Michael Davis



Eva Hansen



Miguel Hermo



Benedikt Wurkner

# Mentors (providing advice&feedback to lecturers)



Danilo Piparo



Nikos Kasioumis



Sebastian Lopienski



Alberto Pace



Sebastien Ponce



Are Strandlie



Enric Tejedor



Ivica Puljak

# CSC Organizers




**Joelma Tolomeo**  
(CSC Administrative Manager)



**Nikos Kasioumis**  
(CSC Technical Manager)

# Logistics

- You can attend only selected lectures
  - but **please be on time for the start**,  
and avoid leaving in the middle of a lecture
- Please silence your phone A red circle with a diagonal slash over a black mobile phone icon, indicating that mobile phones should be silenced.
- Please use the microphone when asking questions
  - lectures are webcast and recorded
- Enjoy coffee and snacks
  - an opportunity to discuss with lecturers and colleagues

# iCSC booklet



For those registered participants  
... and others, if enough copies

# Enjoy the School!



