



**Research School: Shape optimization, spectral  
geometry and calculus of variations  
CIRM Luminy March 29 - April 2  
Program**

**Monday, March 29**

**8:30 - 9:45** Jimmy Lamboley: *Some theoretical aspects of shape optimization (1)*

**9:45 - 11:00** Bruno Colbois and Pedro Freitas: *Spectral geometry (1) Spectral isoperimetric inequalities: the Euclidean case*

**11:00** Coffee break

**11:15 - 12:15** Giuseppe Buttazzo : *Upper and lower bounds for some shape functionals*

**12:30** Lunch

**15:00 - 16:40** Almut Burchard: *Geometric inequalities for non-local functionals (1): Rearrangement inequalities for convolutions*

**16:40 - 17:00** Coffee break

**17:00 - 18:30** Working Session<sup>1</sup>

**19:30** Dinner

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<sup>1</sup>working sessions= exercises classes or/and open problems given by young participants and office hours of professors

**Tuesday, March 30**

**8:30 - 9:45** Charles Dapogny and Edouard Oudet: *Numerical study of shape optimization problems (1)*

**9:45 - 11:00** Jimmy Lamboley: *Some theoretical aspects of shape optimization (2)*

**11:00** Coffee break

**11:15 - 12:15** David Krejcirik: *Spectrum of the Möbius strip: true, fake and not-so-fake*

**12:30** Lunch

**15:00 - 16:40** Almut Burchard: *Geometric inequalities for non-local functionals (2): Non-local shape optimization problems driven by pair interactions*

**16:40 - 17:00** Coffee break

**17:00 - 18:00** Iosif Polterovich: *The Dirichlet-to-Neumann map, the boundary Laplacian and Hörmander's rediscovered manuscript*

**19:30** Dinner

**Wednesday, March 31**

**8:30 - 9:45** Bruno Colbois and Pedro Freitas: *Spectral geometry (2) Spectral isoperimetric inequalities: the case of hypersurfaces*

**9:45 - 11:00** Charles Dapogny and Edouard Oudet: *Numerical study of shape optimization problems (2)*

**11:00** Coffee break

**11:15 - 12:30** Jimmy Lamboley: *Some theoretical aspects of shape optimization (3)*

**12:30** Lunch

**14:00 - 17:00** Free afternoon

**17:00 - 18:30** Working Session

**19:30** Dinner

**Thursday, April 1**

**8:30 - 9:45** Jimmy Lamboley: *Some theoretical aspects of shape optimization (4)*

**9:45 - 11:00** Charles Dapogny and Edouard Oudet: *Numerical study of shape optimization problems (3)*

**11:00** Coffee break

**11:15 - 12:30** Bruno Colbois and Pedro Freitas: *Spectral geometry (3) Spectral isoperimetric inequalities: the Euclidean case*

**12:30** Lunch

**15:00 - 16:40** Almut Burchard: *Geometric inequalities for non-local functionals (3): Symmetrization on spaces of bounded mean oscillation*

**16:40 - 17:00** Coffee break

**17:00 - 18:30** Working Session

**19:30** Dinner

**Friday, April 2**

**8:30 - 9:45** Bruno Colbois and Pedro Freitas: *Spectral geometry (4) Spectral isoperimetric inequalities: the case of hypersurfaces*

**9:45 - 11:00** Charles Dapogny and Edouard Oudet: *Numerical study of shape optimization problems (4)*

**11:00** Coffee break

**11:15 - 12:15** Cristina Trombetti: *Sharp inequalities for solutions to elliptic problems with mixed boundary conditions*

**12:30** Lunch

*End of the School*