# Sylvain Carpentier

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## Research Interests
Mathematical physics, integrable systems, noncommutative algebra.

## Employment
| | |
|---|---:|
| -Senior Researcher at **QSMS**, Seoul National University | current |
| -Simons postdoctoral research scientist at **Columbia University** | 07/2017-06/2021 |

## Education
| | |
|---|---:|
| -Graduate student at the **Massachusetts Institute of Technology**, Cambridge MA, supervised by Victor Kac | 2013-2017 |
| -Master of mathematics at **Universite Paris Orsay** | 2011-2012 |
| -Student of the **Ecole Normale Superieure de Paris** | 2009-2013 |

## Diplomas and Awards
| | |
|---|---:|
| - PhD in Mathematics, Massachusetts Institute of Technology | 06/2017 |
| - Johnson Prize for best graduate mathematical paper of the year at MIT | 05/2017 |

*A sufficient condition for a Rational Differential Operator to generate an Integrable System*

## Selected Talks
| | |
|---|---:|
| -Bologna university, | 06/2021 |
| -Université d'Angers, | 03, 05/2021 |
| -Seoul National University, | 12/2020 |
| -Geometric and automorphic aspects of $W$ algebras, Lille 3 | 05/2019 |
| -University of Glasgow, integrable system seminar | 04/2019 |
| -University of Kent, Canterbury, | 04/2019 |
| - DART IX, University of Leeds | 08/2018 |
| - Seminar of Mathematical physics, University of Columbia | 04 and 11/2018 |
| - Kolchin seminar, City University of New York Graduate Center | 09/2017 |
| - University of Kent, Canterbury | 07/2017 |
| - MIT Infinite dimensional algebra seminar, PhD defense | 04/2017 |
| - SISSA, Trieste | 07/2016 |

## Conferences and research visits
| | |
|---|---:|
| - *DART IX* at University of Leeds | 08/2018 |
| - *Representation Theory, Mathematical Physics and Integrable Systems* at CIRM, Luminy, France | 06/2018 |
| - University of kent, UK, visiting J.P. Wang and A. Mikhailov | 07/2017 |
| - *Geometry and Representation Theory*, Schrodinger Institute, Vienna | 01/2017 |
| -SISSA, Trieste, visiting V. Kac and B. Dubrovin | 07/2016 |
| - *Perspectives in Lie Theory*, Centro de Giorgi, Pisa | 01/2015 |
| -Universita di la Sapienza, Rome, visiting Alberto De Sole | 05-07/2014 |

-IHES, Bures sur Yvette, France                                                                2012/2013
-*Algebraic Structures in Integrable Systems* at Moscow State University,                        12/2012

## Publications

*Supersymmetric Bihamiltonian Integrable Systems*,                                               2021
(with U. Suh), Communications in Mathematical Physics, 382, 317-350.

*Lax-Sato formulation of the Novikov-Veselov hierarchy*,                                         2020
arXiv:2004.08489

*p-reduced multicomponent KP hierarchy and classical W-algebras*,                                2020
(with A. De Sole, V. Kac, D. Valeri and J. Van de Leur), Com. in Math. Ph., 380, 655-722.

*PreHamiltonian and Hamiltonian operators for differential-difference equations*                 2020
(with A. Mikhailov and J.P. Wang)     Nonlinearity, 33 (3) article Number 915.

*Rational recursion operators for integrable differential-difference equations*                  2019
(with A. Mikhailov and J.P. Wang) Commun. Math. Phys. 370, 807851 (2019)

*Compatible Hamiltonian operators for the Krichever-Novikov equation*                            2017
C. R. Math. Vol. 355, Issue 7, 744-747

*A sufficient condition for a Rational Differential Operator to generate*                         2017
*an Integrable System*, Japan. J. Math. 12, 33-89 (2017)

*Singular degree of a rational matrix pseudodifferential operator*                               2015
(with A. De Sole, V.G. Kac), Int. Math. Res. Not. IMRN 2015, no. 13, 5162 -5195.

*Some remarks on non-commutative principal ideal rings*                                          2013
(with A. De Sole, V.G. Kac), Comptes rendus Mathematique 351 (2013), 5-8.

*Rational matrix pseudodifferential operators*,                                                  2013
(with A. De Sole, V.G. Kac), Selecta Math. (N.S.) 20 (2014), no. 2, 403-419.

*Some algebraic properties of differential operators*                                            2012
(with A. De Sole, V.G. Kac), J. Math. Phys. 53 (2012), no. 6, 063501, 12 pp.

## Teaching
-Calculus II at Columbia University,                                                         Fall 2018
-Teaching assistant for linear algebra at MIT,                                               2016/2017
- Undergraduate Research mentor at MIT,                                                    Summer 2015
-Teaching assistant for mathematiques I at Paris 7                                           Fall 2013

## Languages
French (native), English (fluent), Spanish (proficient), Korean and Italian (beginner)

## Other interests
Concert pianist. 1st prize in the outstanding amateur piano competition in Paris (2013). Played with the
Boston pops orchestra in 2017.