

# THEORY



# Theorists

# THE (AMSTERDAM) GROUP (PART OF IT)

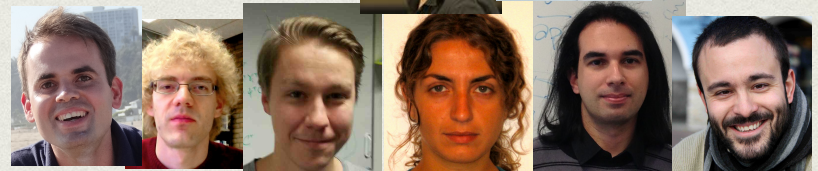


# FACEBOOK

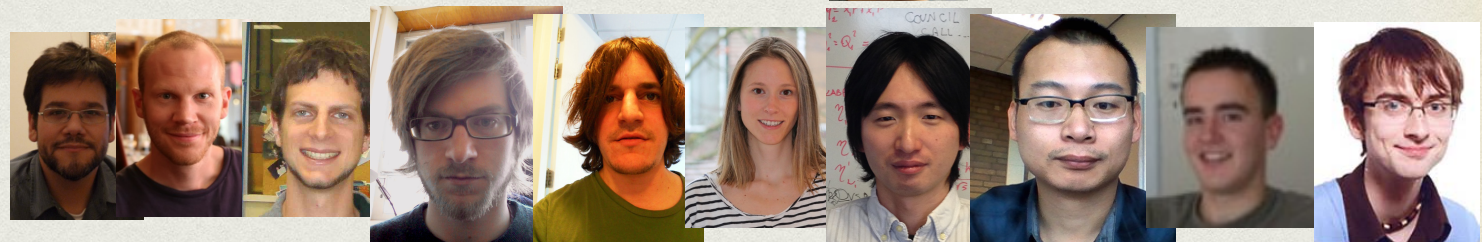
- Staff Nikhef-A + VU + RU. Groningen, see this morning



- Postdocs that left this year



- Postdocs now



- PhD's



- Master students



- Regular and long term guests



- Many visitors



# NEW PHD'S, POSTDOCS, MASTER STUDENTS

## PhD's

- Jorinde van de Vis [Nikhef, Cosmology], Rob Verheijen [RU, collider physics], Melissa van Beekveld [RU, top quark physics]
- 3 openings

## Postdocs

- Jonathan Gaunt [←DESY, QCD], Lisa Zeune [←UvA, QCD]
- Jordy de Vries [←Juelich, Effective theory]
- 4 openings from various grants

## Master students

- Marthijn Sunder, Martijn Hidding [UU], Jort Sinnighe-Damste, Pieter Bas Visser, Ruben Jaarsma [UvA]

# WHERE DO THEORISTS GO AFTER NIKHEF

## Our postdocs

- Olli Taanila -> Helsinki
- Kallia Petraki -> Paris
- Miguel Echevarria -> Barcelone
- Mathias Ritzmann -> Zurich
- Cristian Pisano -> Antwerp->Pavia

## Our PhD's

- Maarten Buffing -> postdoc at DESY
- Kristof de Bruyn -> postdoc in Marseille
- Ivano Lodata -> postdoc in Pune

## Our Masters

- Jeroen Rodenburg -> PhD in Utrecht

# Events



# SINTERKLAAS



By Ben, Gillian, Jorinde



By Jacopo, Sabrina, Tom

Quiz: where is this picture taken?

# PROF. WIM BEENAKKER

Oratie UvA  
10 Juni 2015



# JOSFEST

## JosFest 3 July 2015

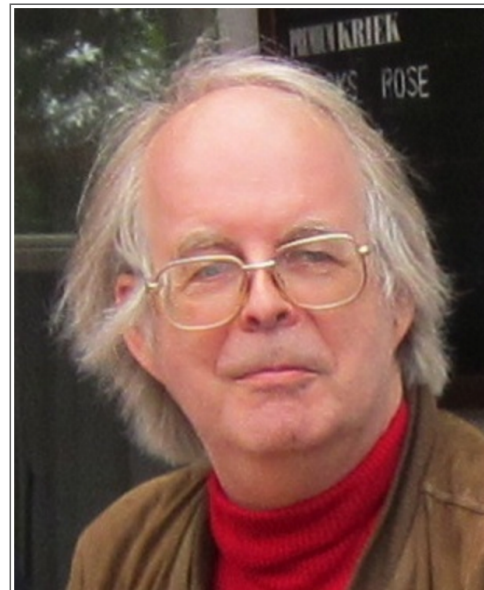
[home](#) [programme](#) [location](#) [photos](#) [travel](#) [hotel](#) [tourism](#)

### Josfest

We organize a special meeting to celebrate Jos Vermaseren's 66<sup>th</sup> birthday at Nikhef in Amsterdam, on Friday 3 July 2015. Participation is by invitation.

Jos has spent a life in particle physics and at Nikhef working on the phenomenology and methodology of perturbative quantum field theory, and, of course, developing and being in charge of the FORM computer programme.

In this meeting we will celebrate his achievements, renew friendships and acquaintances. The meeting starts 3 July 2015 at 14:00.



$$\left(\frac{P,Q}{Q^2}\right)^n \text{ (diagram) } = \frac{1}{N-n+2} \left(\frac{P,Q}{Q}\right) \text{ (diagram) } + \text{ (diagram) }$$

# JOSFEST



Many came, from all over Europe,  
and even from Japan



# Management innovation at “All-Hands Meeting”

by Bert Schellekens

## PhD students

**Elisa Mariani**



Perturbative QCD for the LHC: NNLO computation and resummation at small- $x$ .

**Domenico Bonocore**



My work concerns perturbative QCD, resummation and collider phenomenology more in general.

**Michael Wiechers**



Cosmology; Dark Matter

**Giuseppe d'Ambrosi**



I study theoretical models for Extreme Mass Ratio Inspirals and numerical evaluation of the emitted gravitational waves in General Relativity. As such I am also member of the

**Satish Kumar Saravanan**



Gravitational Wave Theory: Extreme Mass Ratio Inspirals

**Robbert Rietkerk**



Higher order corrections in perturbative quantum field theory with applications to collider phenomenology.

**Jorinde van de Vis**



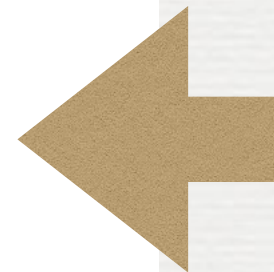
Cosmology.

**Andrea Signori [VU]**

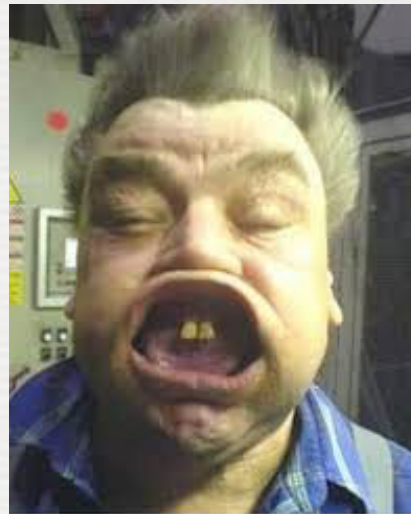


Theoretical investigation of transverse momentum distributions for quarks and gluons inside hadrons and their phenomenological impact in high energy physics

Pictures needed  
for theory webpage



If no picture supplied, one of these will be put there



# Quick result

## PhD students

**Elisa Mariani**



Perturbative QCD for the LHC: NNLO computation and resummation at small- $x$ .

**Satish Kumar Saravanan**



Gravitational Wave Theory: Extreme Mass Ratio Inspirals

**Domenico Bonocore**



My work concerns perturbative QCD, resummation and collider phenomenology more in general.

**Robbert Rietkerk**



Higher order corrections in perturbative quantum field theory with applications to collider phenomenology.

**Michael Wiechers**



Cosmology; Dark Matter

**Jorinde van de Vis**



Cosmology.

**Giuseppe d'Ambrosi**



I study theoretical models for Extreme Mass

**Andrea Signori [VU]**



Theoretical investigation of transverse

Theses, Funding, research etc



# THESES AND DEGREES

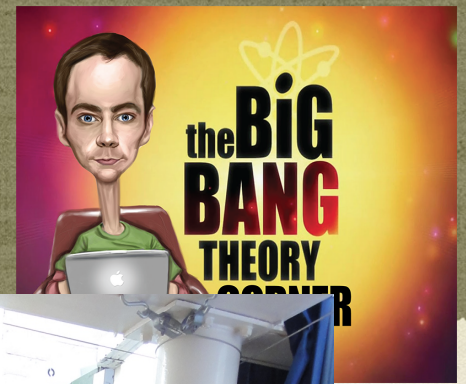
- PhD degrees in 2015

- [Kristof de Bruijn](#) Searching for Penguin footprints [VU] (Fleischer, Koppenburg)
- [Maarten Buffing](#) Color and TMD universality in hadronic interactions [VU] (Mulders)
- [Elisa Mariani](#) Single top production at NNLO [Louvain + Milan (tomorrow!!)] (Duhr, Maltoni, Forte)

- Master degrees in 2015

- [Claudio Pollice](#): Extreme mass binary mass ratio systems [UvA] (van Holten)
- [Shahzeb Kamal](#): Modified gravity and Higgs Inflation [UvA] (Postma)
- [Sjoerd Vogel](#): Calculations of jet substructure [UvA] (Waalewijn)
- [Jeroen Rodenburg](#): Unstable particles and resonances [UU] (Laenen)

# THEORY AND NIKHEF



- Open day:

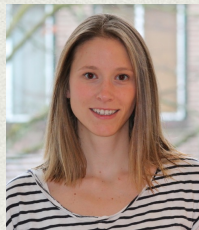


# EXTERNAL FUNDING

- **Vidi: Kallia Petraki**
  - *Self-interacting Dark Matter*
- **ERC Starting Grant: Wouter Waalewijn**
  - *Precision Multi-Scale Predictions*



- **2 Veni's: Lisa Zeune and Jordy de Vries**



See her talk!



Dark Matter and Effective Field Theory

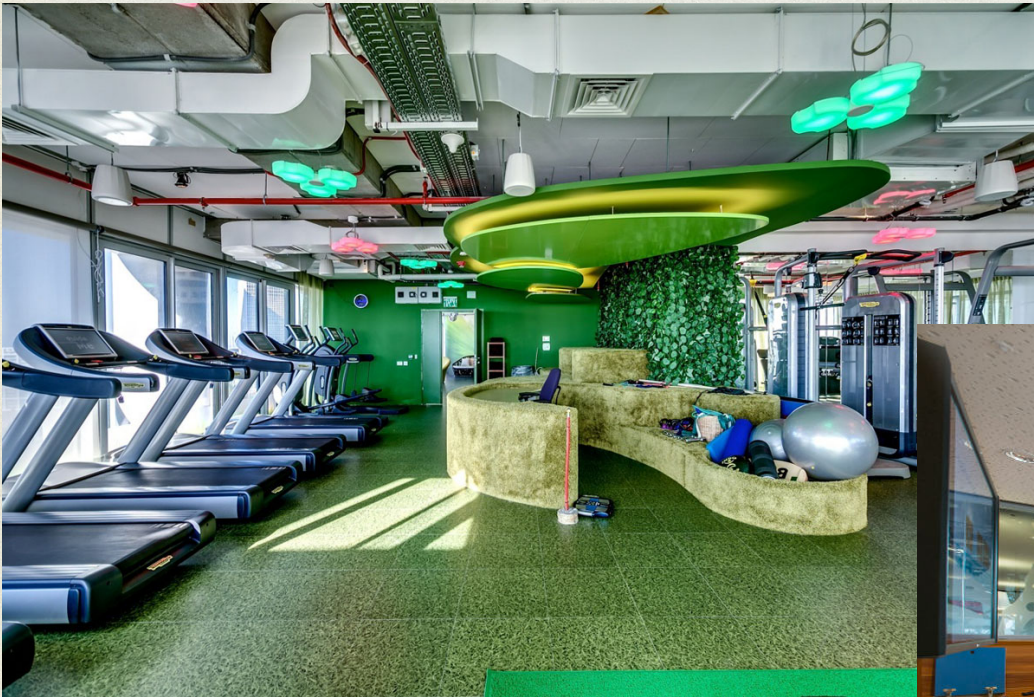
- **eCOST network [Laenen, Beenakker] on BSM physics**



Vidi party at  
Theory Outdoor Lounge

# THEORY AND RENOVATION

- Approved: **Future theory lounge**



# THEORY AND EXPERIMENT

- Papers
  - TMD's, double parton scattering
- Monte Carlo
  - Electroweak corrections
- Discussions
  - B-physics, Higgs physics, Top physics , QCD, Dark Matter, Gravitational waves
- Visitors and networks
  - ATLAS & Theory in HiggsTools EU Network
- Students
  - PhD: de Bruyn, d'Ambrosi, Kumar

# LOTS OF GOOD

- **Higgs boson gluon-gluon fusion at three loops (NNNLO)** [Anastasiou, Duhr, Dulat, Furlan, [Herzog](#), [Mistlberger](#)]
- Diamond rule for multi-loop Feynman diagrams [[Ruijl](#), [Ueda](#), [Vermaseren](#)]
- Functional determinants, index theorems, and exact quantum black hole entropy [Murthy, [Reys](#)]
- IIB Supergravity [[Ciceri](#), [de Wit](#), [Varela](#)]
- Soft radiation at one loop [[Kasemets](#), [Waalewijn](#), [Zeune](#)]
- Dark matter bound states from Feynman diagrams [[Petraki](#), [Postma](#), [Wiechers](#)]
- Anatomy of B- $\rightarrow$ DD decays [Bel, [de Bruyn](#), [Fleischer](#), [Mulder](#), [Tuning](#)]
- Rigid 4D N=2 supersymmetric background and actions [[Butter](#), [Inverso](#), [Lodato](#)]
- Spinning bodies in curved spacetime [[D'Ambrosi](#), [Kumar](#), [van de Vis](#), [van Holten](#)]
- A factorization approach to next-to-soft power threshold logarithms [[Bonocore](#), [Laenen](#), [Magnea](#), [Melville](#), [Vernazza](#), [White](#)]
- Imaginary parts of Wilson line correlations [[Laenen](#), [Larsen](#), [Rietkerk](#)]

over 40 papers..



# WELCOME TO NIKHEF FOR GRONINGEN THEORY!



Elisabetta, Daniel, Eric, Diederik, Rob, Kyriakos

and all their postdocs, PhD's,...

# WE LOOK FORWARD TO

- 6+ PhD defenses
- Lots of excellent research, collaboration, more visitors
- For now 3 talks: Andrea (via Piet), Lisa, Adolfo