

Beamline for Schools

Dominicus College

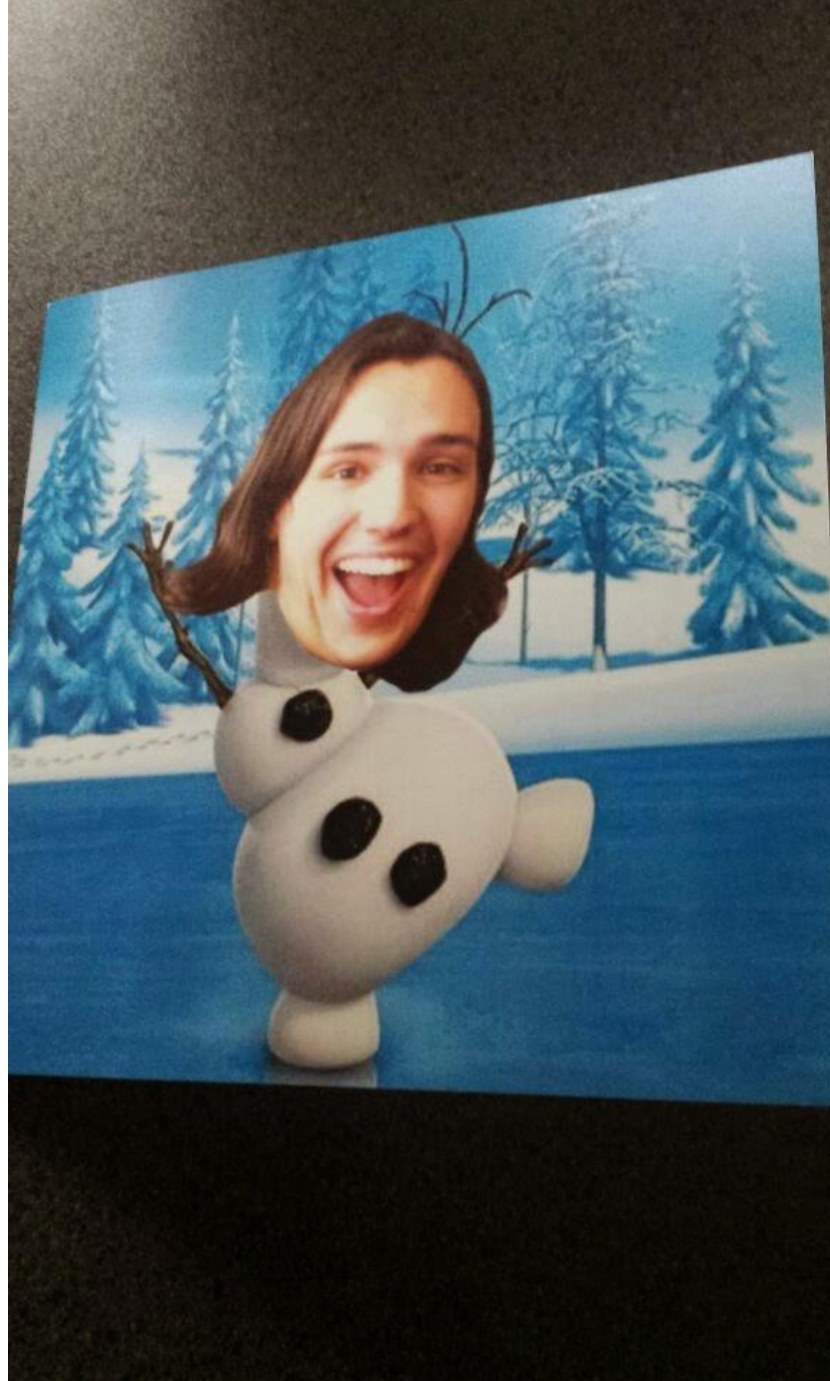
A winning team of the
1st edition (2014)

Dominicus College, Netherlands

Rachel Crane, Guusje (Augusta) van Haren, Olaf Leenders, Mil
Engelen, Rolf van Kleef, Lisa Biesot, Charles Timmermans



How it started:
kids need motivation



Study and write a proposal (with help from Charles)



Almost giving up at the last minute.
Making the video after a bit of protest



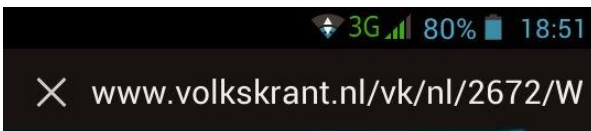
YouTube video turned out great! I'm proud that they finished and send in the proposal 😊



"I believe luck is preparation meeting opportunity. If you hadn't been prepared when the opportunity came along, you wouldn't have been 'lucky.'" 19 mrt 2010 Oprah Winfrey

- NLT -> Learning about crystals -> results in idea to make crystals and build calorimeter
- New Media -> Learning how to make a film
- Physics -> Learning the basics to understand the experiment
- Universum -> Technical background
- Personality -> persevere even if it's difficult or you "don't have time"

Winning!



Nijmeegse scholieren winnen prijs van CERN

NIJMEGEN – Het Nijmeegse Dominicus College en de Varvakios Pilot School uit Athene hebben de eerste ‘Beam line for schools competitie’ van CERN gewonnen. Het Europees laboratorium voor deeltjesfysica, gevestigd in Genève in Zwitserland, bestaat zestig jaar. Daarom werd er een competitie voor middelbare scholen gelanceerd. Leerlingen moesten een experiment bedenken, waarbij ze de deeltjesbundel van CERN konden gebruiken. Lisa Biesot, Milou Engelen, Guusje van Haren, Rolf van Kleef en Olaf Leenders kwamen met het idee om zelf kristallen te laten groeien, om een calorimeter (instrument dat energie van individuele deeltjes kan meten) te ma-

ken en vervolgens testen uit te voeren in een deeltjesbundel. ‘Met ons experiment hopen we dat andere leerlingen net als wij geïnteresseerd raken in de wonderlijke wereld van de natuurkunde’, schreven de leerlingen in hun voorstel. Ze werden hierbij begeleid door hun natuurkundedoцент Rachel Crane. Daarnaast kregen ze advies van deeltjesfysicus Charles Timmermans van de Radboud Universiteit Nijmegen. Bijna driehonderd scholen stuurden een plan in. Wetenschappers van CERN beoordeelden de inzendingen op creativiteit, motivatie, haalbaarheid en wetenschappelijke methode. Na twee evaluatierondes bleven er zestien teams over. Het comité besloot daarop niet één, maar twee winnaars aan te wijzen. De beide scholen zijn in overleg met CERN over de natuurkundige en technische details, zodat de experimenten kunnen worden voorbereid. De leerlingen mogen in september de proeven uitvoeren in Genève.

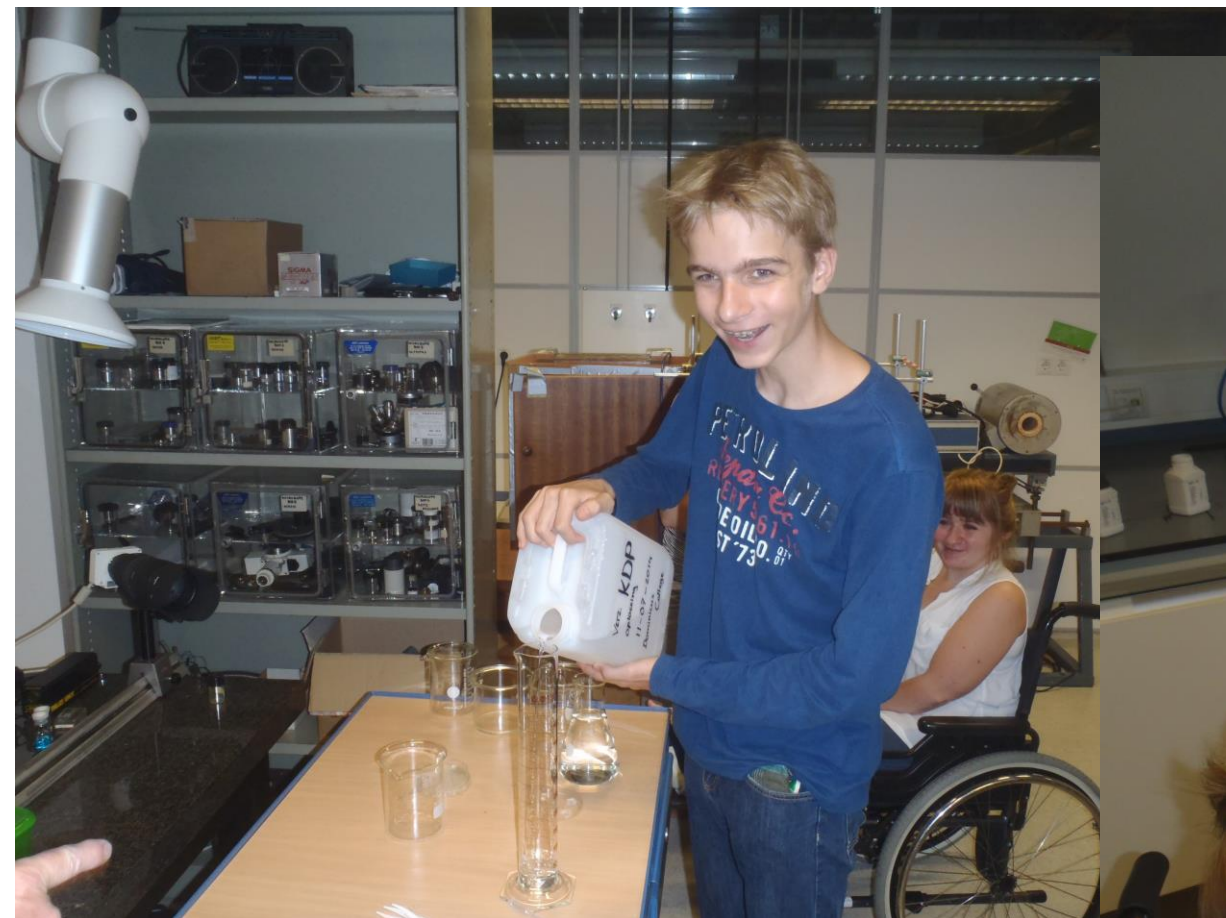
► Nijmeegse leerlingen hopen dat hun experiment bij andere leerlingen interesse opwekt voor natuurkunde



Working during the summer holiday



Making crystals



Building the calorimeter



Arriving at CERN, meeting Cenk, Saime, Markus, Christoff and all the others in person



Getting along really well with the Greek team, making new friends

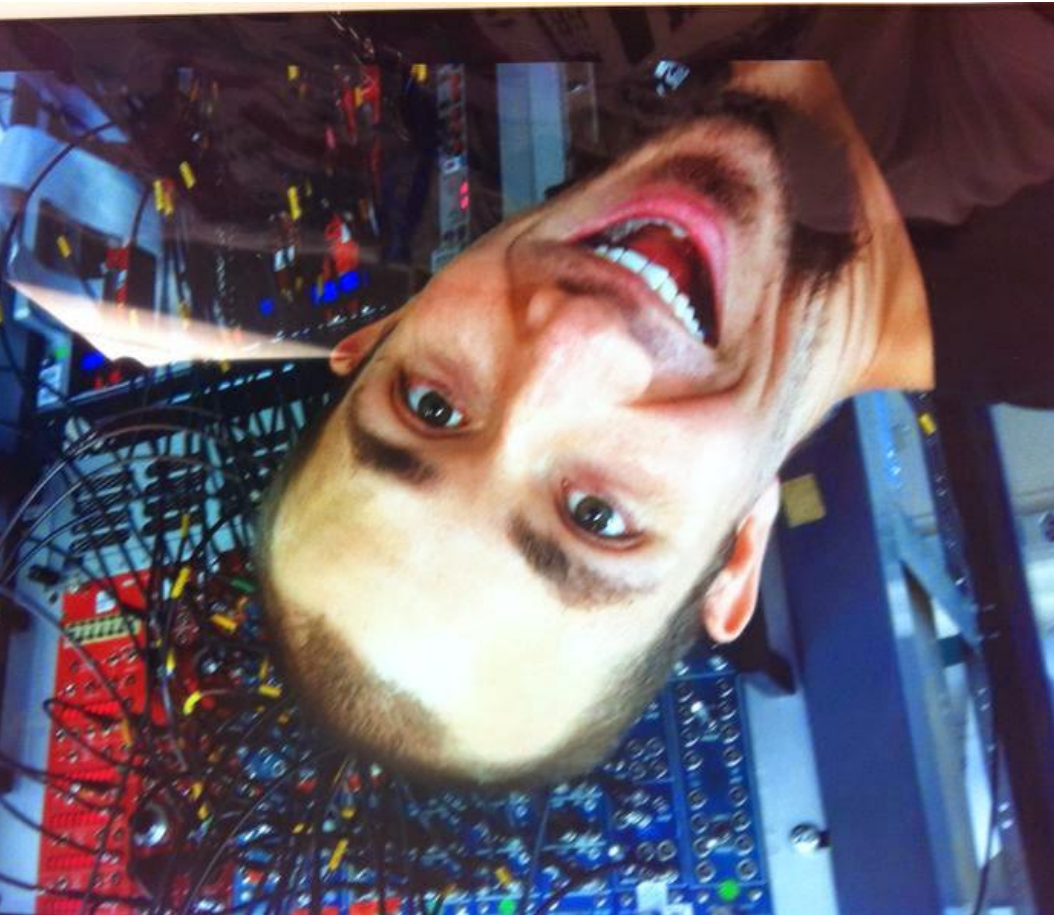


What I learned about the Greek and Dutch team



- Speaking English to each other is weird for the kids the first day, but after 2 weeks, they can't stop, even if it isn't necessary.
- The Greek team, with Andreas as outstanding teamcaptain, had a very high level of theoretical knowledge. The Dutch were more confident with the practical work than the Greek. The students helped each other and learned from each other. The Greek explained their experiment to the Dutch and the Dutch found it great to explain to the Greek how to set up their equipment.
- I wish I learned more about the research done by both teams on forehand, I wish i spoke to my colleagues more, I wish i could have been at three places at the same time.

Great vibe during
the shifts



Learning more about working at CERN



Spending free time in Geneva



Back home, working at the article and spreading the word to fellow students



Building and testing a high school calorimeter at CERN

Authors

L. Biesot¹, R. Crane¹, M. A. G. Engelen¹, A. M. A. van Haren¹, R. H. B. van Kleef¹, O. R. Leenders¹, C. Timmermans²

¹: Dominicus College, Nijmegen, The Netherlands

²: Nikhef and Radboud University, Nijmegen, The Netherlands

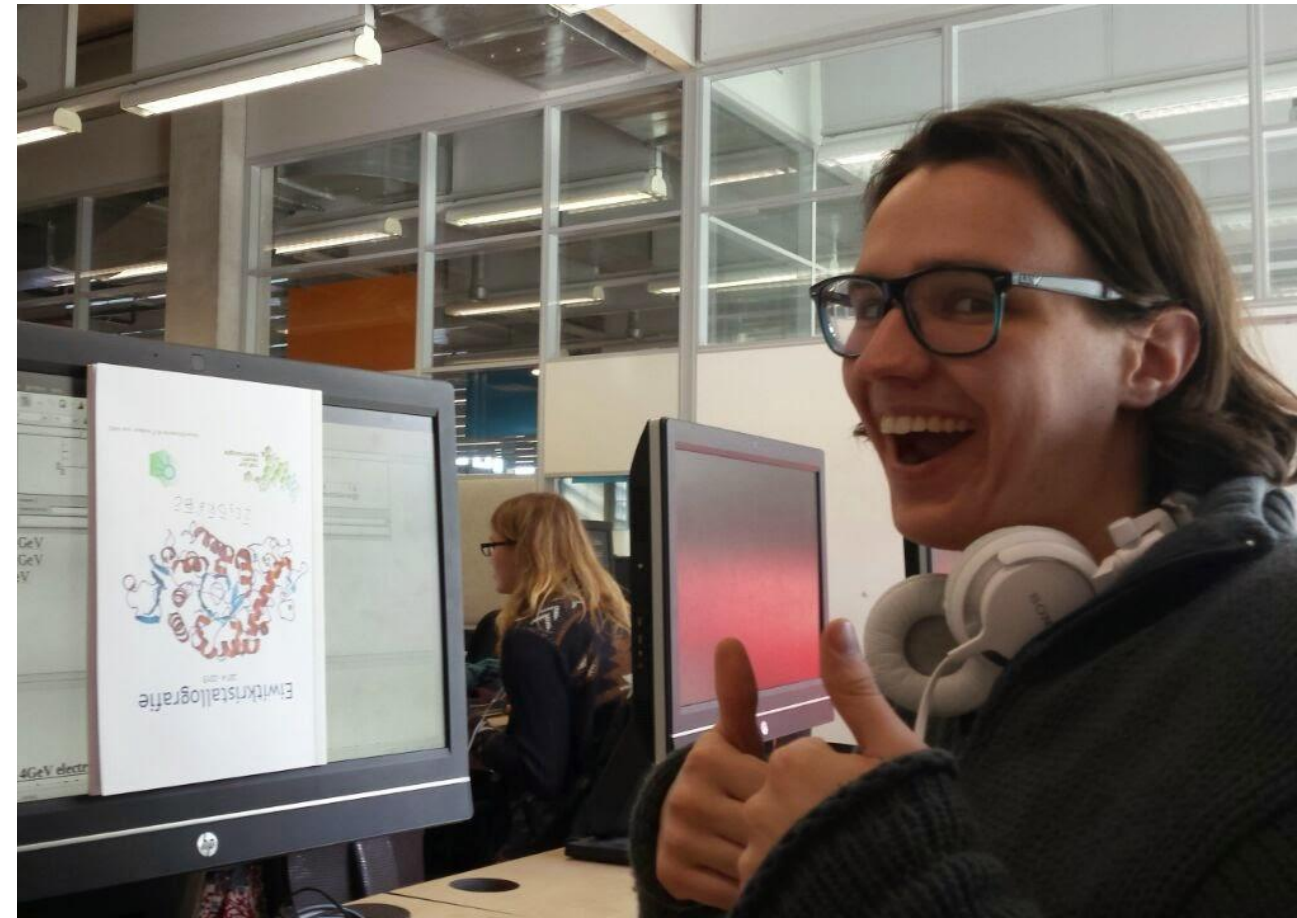
Abstract

We have designed, built and tested a crystal calorimeter in the context of CERN's first beam line for schools competition. The results of the tests at CERN show that the light output of our calorimeter depends on the energy deposited by particles (electrons and muons) hitting the crystals. Our design can be reproduced by high schools around the world, as we have avoided the use of toxic chemicals.

Introduction

As team Dominicuscollege we were the co-winners of the first Beamline for Schools (BL4S) competition of CERN, which was held in 2014. Together with the other winning team, Odysseus' Comrades from Greece, we worked at CERN for ten days to carry out our experiments.

Our proposal was to build a crystal calorimeter (device used for measuring energy) using self-grown KDP crystals. At CERN, our goal was to calibrate and test our calorimeter to see if we would be able to distinguish electrons and muons by their energy deposits.



Having the article published



IOPscience Journals Books Publishing Support Login

Physics Education

PAPER

Building and testing a high school calorimeter at CERN

L Biesot¹, R Crane¹, M A G Engelen¹, A M A van Haren¹, R H B van Kleef¹, O R Leenders¹ and C Timmermans²

Published 3 October 2016 • © 2016 IOP Publishing Ltd

[Physics Education, Volume 51, Number 6](#)

Citation L Biesot *et al* 2016 *Phys. Educ.* 51 064002

DOI 10.1088/0031-9120/51/6/064002

[References](#)

[+ Article and author information](#)

Abstract

We have designed, built and tested a crystal calorimeter in the context of CERN's first beam line for schools competition. The results of the tests at CERN show that the light output of our calorimeter depends on the energy deposited by particles (electrons and muons) hitting the crystals. Our design can be reproduced by high schools around the world, as we have avoided the use of toxic chemicals.

Export citation and abstract

[BibTeX](#)

[RIS](#)

10 years later

- The team is still very positive about their experience at CERN.
- We kept in contact and some teammembers visited members of the Greek team in Greece, where they were also welcomed by Andreas who gave them a tour
- They are not sure about working at CERN at the moment, but they will highly recommend it to other people.
- For me: before BL4S I wasn't that interested in the research done here. After our visit and after learning more about theoretical physics, I am teaching about these subjects and about CERN with growing enthusiasm. I also learned to lay the bar higher so students can excel.