

## **Letter of recommendation for Daniel Bjorkman**

To whom it may concern:

In the year 2016 Daniel Bjorkman has started his work as a fellow (post doc) in CERN's Radiation Protection group. His project under my supervision dealt at the beginning mainly with radiological aspects of the new SPS beam dumping system. This topic is very versatile and comprises all RP aspects like prompt radiation production, material damage, activation production in accelerator components and the tunnel structure and air activation. He contributed very successfully to the design of this new dump system, which is currently implemented in the accelerator.

Since Daniel was very efficient in fulfilling his tasks, he found time to cover also other simulation aspects of the SPS. Amongst those, one finds the future SPS collimation system, the SPS scraping system and above all the SPS beam extraction system (BA2) that is used to deliver particles to the North Experimental area of CERN. This extraction area is one of the most critical areas in the SPS complex in terms of radiation protection. With regard to the radiological consequences arising with the potential future increase of beam power being extracted from this area, a revamp of the components will be indispensable. In collaboration with colleagues from other departments, Daniel found ways to decrease the material activation and residual dose rate in this area by exchanging beam line equipment with components constructed of materials that are less activation prone than those currently used. His study, in case being implemented, will help to reduce significantly the radiation level caused by beam losses.

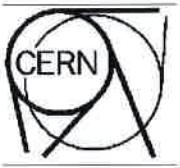
Within the last year of his CERN fellowship Daniel dealt also about the radiological aspects of the LHC experiments. However, this aspect was not carried out under my supervision. Hence, my report will not cover this part of his work.

In order to carry out all these studies, Daniel was able to learn the Monte Carlo particle transport code FLUKA within shortest delay. Daniel comprehends now very well the concept of FLUKA simulations and he was very capable to deliver reasonable and reliable results. Moreover, he is one of the few persons in the radiation protection group who uses the FLUKA code in combination with particle tracking codes used to quantify beam losses.

He is very interested in radiation physics, Monte Carlo simulations, RP concepts and particle accelerator physics. Due to his competences and his friendly character, Daniel is highly accepted and appreciated by the members of the HSE-RP group and by his collaborators in other departments. He is on the one hand capable to solve problems independently and on the other hand to work very efficiently as a member of a team.

Daniel is surely an asset for a group, which is looking for a RP person with strong background in Monte Carlo simulations. His fine character and his willingness to help others was always appreciated by his colleagues and by his hierarchy.

Helmut Vincke (CERN HSE-RP-AS)



**ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE  
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Geneva, August 27, 2019

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TO WHOM IT MAY CONCERN

Daniel Björkman has been working for the last three years in the Radiation Protection Group as a CERN Fellow. Since one year, he has spent 50% of his work-time under my technical supervision on radiation protection studies for the LHC Experiments ALICE and ATLAS.

Daniel has performed residual dose rate calculations for the Long Shut-down 2 for the ATLAS experiment and activation zoning calculation for both the ALICE and ATLAS experiments. He has used the SESAME code, coupled to the FLUKA code, to perform these calculations. In addition, Daniel has updated the FLUKA geometry of the ATLAS experiment to better match the existing technical drawings and the geometry used in the Geant4 Monte Carlo simulations by the ATLAS collaboration.

On Daniel's initiative and based on our joint preparation, Daniel and I have performed, with help from Anna Cimmino, a measurement campaign of residual dose rates for the ATLAS detector in 2019 and compared the measurement to FLUKA simulations performed by Daniel. He also performed all the data management and analysis for this benchmark study.

Daniel's dedication and enthusiasm for his projects are impressive. He likes to take the initiative and to explore new or better ways to advance projects. His very strong computing skills help Daniel to achieve results on very short time scales. Daniel has familiarized himself also extremely fast with the SESAME code, a complex collection of FLUKA user routines written in Fortran77, C++ code, python code and shell scripts.

Daniel does not hesitate to ask questions. This, together with his computing skills, has allowed fast iterations for our joint projects. A very good example for his commitment and way of working is the above mentioned residual dose rate benchmark study for the ATLAS detector.

Daniel reflects critically on the results that he obtains. The visual communication of results is very important to him and he produces very high quality figures that take the content and the receiver of the communication very well into account. Daniel has presented his work on numerous, well-received occasions in the ATLAS Radiation Simulation Working Group and has collaborated independently with several members of the working group.

I remain at your disposal for any further information that you may need.

Yours sincerely,

A handwritten signature in blue ink, consisting of two parts: a stylized 'R' on the left and a more fluid 'Robert Froeschl' on the right.

Robert Froeschl  
Radiation Protection physicist HSE-RP-AS  
Radiation Safety Officer of the HSE unit  
Chairperson of the Radiation Safety Officers Committee



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Our reference:  
***Recommendation letter for  
Daniel Björkman***

Geneva, May 11<sup>th</sup>, 2021

**To whom it may concern**

I firstly met Daniel in November 2016 when he joined, as student, the official FLUKA beginner course in Shanghai (China), where I was member of the teaching board. From the very first impression, Daniel appeared as a brilliant and motivated young scientist and after our first meet I had the occasion to collaborate with him on different projects.

In summer 2020 I was looking to hire a Temporary Labor (TEMP) to work under my supervision on radiation protection (RP) studies relevant for the CERN Large Hadron Collider (LHC) and its future upgrade, the High-Luminosity LHC (HL-LHC). Daniel was the perfect match for this position given his extensive experience in radiation protection of high-energy particle accelerators, his expertise in FLUKA simulation, his programming skills and his strong commitment to work.

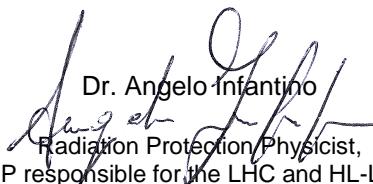
From the very beginning, Daniel received the very challenging task to perform high-priority RP studies relevant for the LHC upgrade, including the decommissioning of 800+ meters of beam line elements and auxiliary equipment, and the installation of the new HL-LHC machine. To complete this task Daniel, performed complex FLUKA Monte Carlo simulations and produced a series of python tools for the post-process and analysis of the data.

In addition to the previous project, Daniel received also the task to perform a detailed analysis of activation samples placed into the LHC tunnel during the last operational run. This specific task required the development of a new in-house python program for the analysis of a large number of samples.

In only eight months, Daniel was able to achieve the number of tasks I assigned him and to produce even more results relevant for the project and the organization, particularly for planning the complex upgrade of the LHC, currently scheduled in 2025. Daniel documented his activity in internal technical reports, presentations and he is also first author of a scientific contribution to the ICRS 14 conference. Daniel was able to organize his work in autonomy, reporting to me on a weekly basis in dedicated meetings. Daniel is also a valuable team-member and he was involved in the training of a new fellow.

I strongly recommend Daniel for the position he is applying for and I remain at your disposal for any additional questions that might arise along the application process.

Sincerely yours

  
Dr. Angelo Infantino  
Radiation Protection Physicist,  
RP responsible for the LHC and HL-LHC

To whom it may concern

**Prof. Dr. Damien Charles Weber**  
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Villigen PSI, 1.11.2024

### **Re: Commendatory letter for Daniel Björkman**

Daniel Björkman has been a PhD student at the Center for proton Therapy from September 2021 to October 2024.

Under the direct supervision of my deputy Prof. Tony Lomax, he was involved in a number of projects regarding eye tumor treatment with protons which resulted in several high-quality papers, including but not limited publications assessing the effect of intra- and inter-fractional motion on target coverage and the optimization of ocular proton therapy through patient-specific surface reconstructions. Importantly, he published also dose driven gaze optimization papers for this treatment modality delivered to the eye.

To put my level of enthusiasm simply, I can only strongly recommend Daniel Björkman. Academically, I had the opportunity to review his work and was definitively impressed by his drive & commitment to his work. If he wants to pursue an academic career, he will definitively have the means to do so.

To summarize, Daniel Björkman is a highly motivated phycisist, hard worker and pleasant young man. I can recommend him to any program with complete confidence.

**PAUL SCHERRER INSTITUT**  
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**Dr.med. Damien Charles Weber**

Head & Chairman CPT, Paul Scherrer Institute

Professor of Radiation Oncology, Faculty, University of Zürich

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To whom it may concern

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Villigen PSI, 15 January 2025

### **Daniel Björkman: Letter of Recommendation**

I am pleased to write this letter of recommendation for Dr. Daniel Björkman, who recently completed his PhD at ETH Zurich under my supervision. Daniel's research focused on developing a dose calculation engine for ocular proton therapy at Paul Scherrer Institute's OPTIS2 dedicated nozzle and applying this engine to address significant research questions in the field.

Daniel's dissertation reflects both the scope of his ambition and his technical skills. He successfully developed and validated OCULARIS, a dose calculation engine, which served as the foundation for three original investigations: a simulation study on dose distribution and target coverage, an optimization study for automated treatment planning, and an exploration of patient-specific surface reconstructions to enhance treatment planning. These contributions were presented at international scientific conferences and have resulted in peer-reviewed publications, underlining their impact and relevance.

Daniel's work demonstrates a pragmatic and goal-oriented approach. His focus on results often allowed him to identify efficient solutions and make progress on challenging problems. Daniel also showed a strong willingness to refine his work, respond to feedback, and dig deeper when needed. He worked independently to solve problems and achieved high-quality results, which speaks to his resilience and technical competence.

His dissertation contains valuable insights and has been well received by the scientific community. His study on the effects of motion on target coverage and margins has already been published in a peer-reviewed journal, and another manuscript on treatment plan optimization is under review.

Daniel is a capable and dedicated researcher with a strong technical foundation and the ability to independently solve complex problems. He is persistent, quick to adapt, and has demonstrated a clear potential to contribute significantly to the field of medical physics. I am



confident he will excel in his future endeavors and bring a thoughtful, results-oriented approach to his work.

I am happy to recommend Daniel and would be glad to provide further information if needed.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jan Hrbacek".

Jan Hrbacek, PhD  
Scientific collaborator / Senior project manager

Recipient

**Antony John Lomax**

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Villigen PSI, 28 January 2026

## Recommendation Letter for Dr Daniel Björkman

To Whom It May Concern

From 01.09.2021 to 31.10.2024, Dr Björkman performed his ETH Zurich PhD project in my research group here at the Centre for Proton Therapy of the Paul Scherrer Institut. Dr Björkman's research was aimed at developing a flexible, in-house dose calculation and treatment planning system for our institute's ocular proton therapy (OPT) facility, with which he could then address a number of research questions related to the accuracy and precision of such treatments.

OPT is a very specialized but extremely successful treatment, that has been practiced by a number of dedicated facilities around the world for more than 50 years. However, despite its success, ocular proton therapy still presents some challenges, for instance in the modelling and reproducibility of positioning of the eye from day-to-day of treatment. It is in these areas that Dr Björkman performed his PhD.

He successfully developed and validated an improved dose calculation engine for OPT, which served as the foundation for three novel investigations: a simulation study on dose distribution and target coverage, an optimization study for automated treatment planning, and an exploration of patient-specific surface reconstructions to enhance treatment planning. These contributions were presented at international scientific conferences and have resulted in two peer-reviewed publications as first author, a third paper as co-author and a fourth paper that is currently under review. This output underlines the impact of his work and its relevance to the wider OPT community.

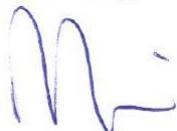
The content of Dr Björkman's dissertation reflects both the scope of his ambition and his technical skills. From the programming and scientific point of view, the quality of his work

was excellent, and he always showed a willingness to work independently and pursue his own ideas. He also showed a clear dedication to his work and the project, including an ability to quickly adapt to the various challenges that can typically occur with such a project.

In summary, it was a pleasure working with Dr Björkman. He is a bright and diligent worker who I have no doubt will have a successful career. I can highly recommend him as a future employee, colleague and collaborator in whatever position he may find in the future.

If you need any more information about Dr Björkman, please do not hesitate to contact me.

Yours sincerely  
Paul Scherrer Institute PSI



Antony John Lomax

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