



Co van Ledden Hulsebosch Center
ANNUAL REPORT 2017 ▶



Academic Medical
Center (AMC)



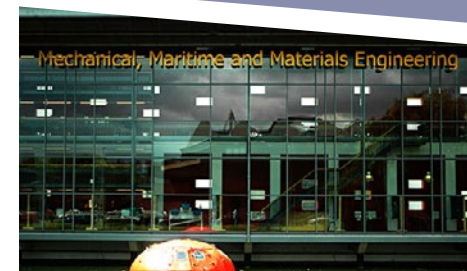
University of Amsterdam
Faculty of Science (FNWI)



Netherlands Forensic
Institute (NFI)



Amsterdam University of
Applied Sciences (HvA)



Delft University –
Faculty of Mechanical, Maritime and
Materials Engineering (3mE)



INTRODUCTION

Maurice Aalders and Arian van Asten

with contributions of Rick van Rijn, Roelof-Jan Oostra, Udo Reijnders, Peter Schoenmakers, Gabriel Vivo-Truyols, Ate Kloosterman, Pim de Voogt, Daniel Bonn, Zeno Geradts, Jaap van Ginkel, Marjan Sjerps, Bert van Es, Pernette Verschure, Eva de Rijke, Isabella von Holstein, Gareth Davies, Christianne de Poot and Arjo Loeve.

The following main goals were formulated in the CLHC 2017 annual plan:

- Transforming the CLHC from the Amsterdam Center for Forensic Science and Medicine to the Netherlands Center for Forensic Science and Medicine.
- Successful coordination and start of the scientific work of submitted 2016-2017 H2020 proposals.
- Participation in new H2020 consortia and project submissions for the 2017-2018 round.
- Contribution to a new NWO/ZonMw program on forensic medicine and active participation in the submission of various project proposals involving several CLHC partners in Dutch consortia.
- Provide support to IIS for the 2017 audit of the Forensic Science Master track to accomplish a successful audit and to collaborate with IIS to implement the audit recommendations with respect to the science-education connection.
- To develop, in collaboration with IIS, hands-on modules for the MFS courses in crime scene science, trace analysis and digital forensics and to build a business case for a forensic R&D and education DNA laboratory.
- Further expand the international network and realization of internships and international R&D visits for master and PhD students from the CLHC and partner institutes.

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- Prepare a bid to organise the IAFS conference which will be presented at IAFS 2017 in Toronto (21-25th of August). The CLHC board will attend this conference to promote the bid and to make the CLHC known to the attendants and board members of the conference. To this end the CLHC will be one of the sponsors of the conference and will provide CLHC promotion material.
- Develop the R&D part of the CLHC website linking it to the participating institutes and scientists.

In 2017, considerable effort was put in each of these priorities with varying degrees of success. The CLHC bid to host the IAFS 2020 in Amsterdam was presented at the IAFS 2017 in Toronto but unfortunately we lost the bid to UTS Sydney. Efforts to coordinate a substantial international forensic project within the H2020 program resulted in a strong proposal with contributions and commitments of many international forensic partners. The proposal scored 'above threshold' but was unfortunately not granted. Although it is disappointing to see good efforts go to waste, there were also some remarkable highlights in 2017. First of all, the AMC managed to officially start what took so many years of planning and perseverance: a unique taphonomic test site (forensic cemetery) in the Netherlands! More information on the ARISTA initiative can be found in a mini interview with its initiator prof. dr Roelof-Jan Oostra. Similarly impressive is the first Dutch MOOC on forensic engineering that was developed and coordinated by dr Arjo Loeve of the Engineering faculty of the TU Delft. Both feature in the mini interview series at the end of the annual report.

Another Amsterdam success was the successful audit of the Master's Program in Forensic Science. The programme has grown in quality and forensic content and the auditors were positive about the strong interaction between forensic science and education as is for instance demonstrated through the annual forensic science symposium, the internships and the Frontiers of Forensic Science lecture series. It is clear that strong forensic science efforts by the CLHC support the forensic science education and vice versa as the talented students from the master are the future PhDs, forensic experts, forensic scientists and possibly even the professors in forensic science at the UvA!

In this annual CLHC report the 2017 results are not only listed and analyzed in terms of quality and quantity but are also categorized according to a number of key activity areas for the CLHC visualized by the following icons :



Scientific Impact



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International Network



Education



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ORGANIZATION

Currently the network contacts within the CLHC organization are well established and the following AMC, UvA, VU, HvA, TU Delft and NFI colleagues played an important role in the center in 2017:

Dean FNWI:	Peter van Tienderen
Chair and dean - AMC:	Hans Romijn
General director - NFI:	Ronald Baarends pv a.i. (key stake holder)
Board chair - AMC:	Ton van Leeuwen, Jaap Stoker
Board chair - FNWI:	Jan Wiegerinck, Joost Reek (Marcel Bartels)
Board member - NFI:	Wim Heijnen
Board member - HvA:	Gerard van Haarlem
CLHC Director - AMC:	Maurice Aalders
CLHC Director - FNWI:	Arian van Asten (for 0.2 fte from NFI)
Education coordinator - FNWI:	Jan Bergstra (interim), Yorike Hartman

Education coordinator - AMC:	Rick van Rijn, Roelof Jan Oostra
Bureau support - FNWI:	Eric Sennema
Bureau support - AMC:	Gepke Uiterdijk
Coordination - BMEPh:	Maurice Aalders
Coordination Radiology - AMC:	Rick van Rijn
Coordination Anatomy, Anthropology, Archeology:	Rick van Rijn
Coordination Forensic Medicine - AMC/GGD:	Roelof-Jan Oostra, Hans de Boer
Coordination HIMS - FNWI:	Udo Reijnders Arian van Asten (Peter Schoenmakers)
Coordination IBED - FNWI:	Pim de Voogt, Ate Kloosterman (Peter de Ruiter)



Coordination IoP - FNWI: (Daniel Bonn)
Coordination Ivl - FNWI: Jaap van Ginkel,
Zeno Geradts
(Marcel Worring)
Coordination KdVI - FNWI: Bert van Es,
Marjan Sjerps
(Eric Opdam)
Coordination SILS - FNWI: Pernette Verschure,
Eva de Rijke
(Marten Smidt)
Coordination - HvA: Christianne de Poot

Coordination TU Delft - 3mE: Arjo Loeve
(Jenny Dankelman)
Coordination VU - FALW*: Isabella von Holstein
(Gareth Davies)
Coordination VU - Science*: Klaas Slooten
(Ronald Meester)
Coordination VU - UMC*: Paul Krijnen
(Hans Niessen)

* partnership to be formalized in 2018

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RESEARCH

Institute	Granted Projects	Ongoing Projects	PhDs/ Postdocs	PhD dissertations	Scientific publications *	Scientific presentations**
BMEPh - AMC	2	3	4/1	0	4	16
RAD - AMC	0	6	6/0	0	13	9
AAA - AMC	2	5	6/0	0	10	6
FMED - AMC	1	2	2/0	0	5	12
HIMS	1	2	3/1	2	6	7
IBED	3	7	5/1	1	8	7
IoP	0	1	1/0	0	1	0
IvI	1	4	7/1	4	3	7
KdVI	1	0	0/0	0	6	5
SILS	0	3	0/1	0	2	4
FALW - VU	0	2	2/1	0	3	5
HvA	2	4	6/0	2	8	10
3mE - TUD	1	0	0/0	0	1	2
Total***	14	33	31/5	8	60	89

Forensic science and forensic science related activities within the CLHC institutes in 2017

* Publications that appeared in a printed volume in 2017 (i.e. full reference available) in peer-reviewed scientific journals (including books and book chapters with ISBN numbers)

** Scientific key note, invited speaker or accepted abstract presentations in official symposia and conferences (excluding workshops and internal UvA and partner events) in 2017

*** The total can be less than the sum of the institute numbers due to collaborations between CLHC institutes.



Special Chairs

The appointment of special chairs is of key importance to develop forensic science areas within the CLHC and connect forensic practice, science and education. These chairs merge the forensic and academic world and the appointed professors form research focal points from which new initiatives can be undertaken and proposals can be submitted. The forensic professors within the CLHC are encouraged to establish interdisciplinary collaborations with the academic partners both in Amsterdam, the Netherlands and abroad. In 2017 one inaugural speech was given, two professors were appointed for a second term and one professor officially retired:

Retirement:

- Forensic Biology @ IBED/FNWI – prof dr Ate Kloosterman (NFI)



*Inaugural speech of
prof dr Christianne de
Poot – October 4th, 2017,
Aula of the VU*

Appointment for a 2nd term:

- Forensic Analytical Chemistry @ HIMS/FNWI – prof dr Arian van Asten (NFI) – 2017-2022
- Forensic Biophysics @ BMEPh/AMC – prof dr Maurice Aalders (AMC) – 2017-2022

Inaugural speech:

- Prof dr Christianne de Poot – Criminalistics – Law/VU – October 4th, 2017: *The reconstruction of criminal activities*

With these developments in total 9 special chairs in forensic science were active within the CLHC network in 2017:

- Forensic Biology @ IBED/FNWI – prof dr Ate Kloosterman (NFI) – 2008-2017 (retirement)
- Forensic Statistics @ KdVI/FNWI – prof dr Marjan Sjerps (NFI) – 2010-2020 (2nd term)
- Forensic Analytical Chemistry @ HIMS/FNWI – prof dr Arian van Asten (NFI) – 2017-2022 (2nd term)
- Forensic Biophysics @ BMEPh/AMC – prof dr Maurice Aalders (AMC) – 2017-2022 (2nd term)
- Forensic Radiology @ AMC – prof dr Rick van Rijn (AMC) – 2014-2019 (1st term)
- Forensic Data Science @ Ivl/FNWI – prof dr Zeno Geradts (NFI) – 2014-2019 (1st term)
- Forensic Medicine @ AMC – prof dr Udo Reijnders (GGD) – 2015-2020 (1st term)
- Mathematics for Forensic Genetics @ Science/VU – prof dr Klaas Slooten (NFI) – 2015-2020 (1st term)
- Criminalistics @ Law/VU – prof dr Christianne de Poot (WODC/HvA/PA) – 2016-2021 (1st term)

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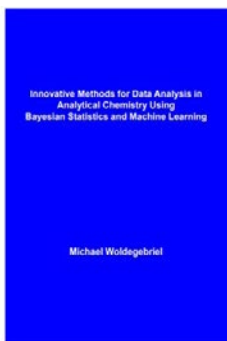
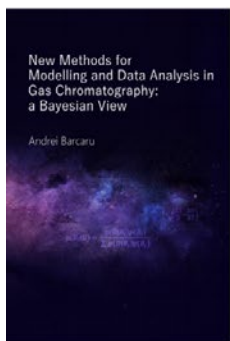


In the near future no new forensic chairs are expected to be established within the CLHC network. The main priority in 2018 will be the succession of prof dr Ate Kloosterman to continue the special chair in forensic biology, a forensic expertise area of critical importance to the forensic science and education in Amsterdam. In the CLHC ambition to expand the network new opportunities for forensic chairs may emerge when new partners join the network.

PhD Theses

The main instrument for forensic scientific studies within the CLHC is the PhD project as this not only yields output in the form of scientific publications but also leads to a new generation of experienced and talented scientists for the criminal justice system. In 2017, in total 8 PhD students successfully defended their forensic thesis (2 theses with a relatively small forensic contribution are not included in the summary below):

- Andrei Barcaru – *New Methods for Modelling and Data Analysis in Gas Chromatography: a Bayesian View* – HIMS/NFI – March 29th, 2017
Promotor: prof dr ir P.J. Schoenmakers,
Co-promotor: dr G. Vivo-Truyols
- Michael Woldegebriel – *Innovative methods for data analysis in analytical chemistry using Bayesian statistics and machine learning* – HIMS/NFI – March 29th, 2017
Promotor: prof dr ir P.J.Schoenmakers,
Co-promotor: dr G. Vivo-Truyols
- David Graus – *Entities of Interest, Discovery in Digital Traces – II* – June 16th, 2017
Promotor: prof dr M. de Rijke
- Jan Zahalka – *The Machine in Multimedia Analytics* – HIMS/NFI – July 6, 2017
Promotor: prof dr M. Worring
- Madeleine de Gruiter – *Combining forensic evidence – KdVI/VU/NFI* – November 9th, 2017
Promotors: prof dr H. Elffers, prof dr C.J. de Poot
- Anna Mapes – *Rapid Technologies at the crime scene, CSI fiction matching reality* – November 30th, 2017
Promotors: prof.dr. A. Kloosterman, prof dr C.J. de Poot



Front covers of the 2017 PhD theses of Andrei Barcaru (FNWI-HIMS, NFI), Michael Woldegebriel (FNWI-HIMS, NFI), David Graus (FNWI-II), Jan Zahalka (FNWI-II), Madeleine de Gruiter (HvA, VU), and Anna Mapes (HvA, IBED-UvA).

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Since the start of the CLHC in 2013 in total 19 students obtained a PhD degree in forensic science.

Annual PhD symposium

In 2017 the 4th edition of the annual CLHC forensic PhD symposium was organized on the 27th of October at CWI Science Park. The theme for this edition was '*forensic science in case work*' to stress the intrinsic objective of every forensic science project to add value to criminal investigations. The symposium was attended by over 100 MFS students, PhD students, scientists, forensic experts and partners from the criminal justice system. Participants were welcomed by prof Ton van Leeuwen and dr Wim Heijnen on behalf of the CLHC board. Plenary presentations were given by Esther Plomp (VU), Karlijn Bezemer (HvA), Brigitte Bruijns (Twente University), Nihad Achetib and Rian Teeuw (AMC) and by invited key note speakers Jan Dalmolen (NFI) and Mark Wiebes (Dutch Police).

A jury with members from the various partners in the criminal justice system selected the following winner for the '*Best PhD Poster Award*' of the 2017 CLHC Forensic PhD Symposium:

- Lode Sibbens – Royal University of Leuven (Belgium):
The development of a forensic clock to determine Time of Death: Initial results

The '*Best Student Poster Award*' was selected by a committee consisting of CLHC PhD students. Various student teams presented their results from the course Advanced Forensic Biology at the symposium.

The winners were:

- S. Divya, Augustina Brunetti, Meghna Swayambhu, Gisela de Heus, Jonna Muller: *Unwinding the clock after death*

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Co van Ledden Hulsebosch junior (grandson with the same name as the famous Dutch forensic pioneer) handing a special book to the Best PhD poster award winner Lode Sibbens from KU Leuven and the Best Student poster award winners (CWI Science Park - 27/10/2017)

During the poster session several new activities were introduced including “Co’s table” with forensic memorabilia from his grandfather, a poster by Verum (the forensic science student association) and a MFS internship matchmaking session for 2nd year students and potential supervisors.



New events during the poster session of the annual CLHC symposium



EDUCATION

The CLHC website is used by the students to find topics and contacts for literature theses and research projects (<http://www.clhc.nl/education>). These topics are provided by the institutional CLHC coordinators and the CLHC network. In the academic year 2017-2018 the literature thesis in the 2nd year of the Forensic Science master was fully coordinated by the CLHC (course coordinator: prof dr Arian van Asten). Additionally, the CLHC wants to ensure that forensic scientific talent is given maximum opportunity to continue their career in forensic science through PhD projects that emerge from the CLHC program.

The CLHC actively supports the Master's in Forensic Science (MFS) program of the Institute for Interdisciplinary Studies (IIS). The coordinators of the program meet regularly with the CLHC Directors and take part in the CLHC coordinator meetings.

PhD symposium

After the successful implementation of a MFS student poster event during the 2015 symposium, 2nd year students participating in the course Advanced Forensic Biology coordinated by SILS and IBED (Pernette Verschure, Martijs Jonker, Ate Kloosterman) presented their forensic biological research proposals for the 3rd time during the 2017 annual CLHC symposium.

Frontiers in Forensic Science sessions

Forensic Science students are strongly encouraged to attend the jointly organized Frontiers of Forensic Science (FFS) sessions. This academic lecture series is thereby part of the MFS program but open to scientists,



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forensic experts and all with a forensic interest. For each session a specific theme is selected for which established scientists, forensic practitioners and new scientific talent are invited to present their latest work. Each academic year the CLHC financially supports invited lectures by renowned forensic scientists from abroad and the organization of one FFS session outside Science Park. The CLHC maintains an extensive contact list from the science, forensic and criminal justice communities and each FFS session is announced on the CLHC website, through an email to registered contacts and via several social media channels. For each session a special, high quality poster announcement is prepared and distributed. Consequently, attendance is high (60-100+) and diverse and this provides excellent opportunities for the students to meet forensic and scientific experts, police officers and legal professionals. In 2017 in total four sessions were organized (two in the academic year 2016-2017 and two in the academic year 2017-2018):

- **Challenges and opportunities in forensic data science** – March 3rd, 2017 – UvA Science Park
Speakers: Paul Duijn (FIOD, UvA), Hans Wim Tinholt (KPMG), Zeno Geradts (IvI, NFI)
- **Alternative matrices in forensic toxicology** – June 9th, 2017 – Avans Hogeschool, Breda
Session Chair: Ben de Rooij (Avans)
Speakers: Ben de Rooij (Avans), Wilco Duvivier (Wageningen/RIKILT), Rogier van der Hulst (NFI), Daan Touw (Groningen)

- **Forensic archeological and human taphonomy expertise in the Netherlands** – September 22nd, 2017 – UvA Science Park
Speakers: Roelof-Jan Oostra (AMC), Mike Groen (NFI), Mark Luschen (Dutch Police), Tristan Krap (AMC)
- **Searching the truth with Artificial Intelligence** – November 24th, 2017 – UvA Science Park
Session Chair: Zeno Geradts (IvI, NFI), Andrea Macarulla Rodriguez (IvI, NFIP)
Speakers: Paul van den Corput (TUE), Jason Maassen (E-science Center), Arthur van Bunningen (Dutch Police), Cor Veenman (NFI)

Teaching

The IIS master program in Forensic Science strongly relies on forensic expert input from the institutes and scientists linked to the CLHC. In the academic years 2016-2017 and 2017-2018 many CLHC associated teachers (often CLHC coordinators, scientists and professors) were involved in the Forensic Master curriculum.

Furthermore, in several courses guest contributions are provided by NFI experts giving the students insights in the role of forensic science in the criminal justice system and the practical considerations of forensic case work.

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Poster announcements of the FFS sessions organized by the IIS and CLHC in 2017

Institute	CLHC coordinator / scientist	Course in de Forensic Science Master	Contribution	Year
BMEPH – AMC	Prof dr Maurice Aalders	Research and Innovation in Forensic Science	Coordinator & Teacher	1
RAD - AMC	Prof dr Rick van Rijn	Physical and Forensic Anthropology	Guest lecture	1
AAA - AMC	Prof dr Roelof-Jan Oostra	Physical and Forensic Anthropology	Coordinator	1
HIMS	Prof dr Arian van Asten	Literature Thesis Criminalistics and Analytical Chemistry	Coordinator Guest lecture	2 1
	Prof dr ir Peter Schoenmakers	Criminalistics and Analytical Chemistry Chemical Analysis for Forensic Evidence	Guest lecture Coordinator & Teacher	1 2
IBED	Prof dr Ate Kloosterman	Forensic Statistics and DNA Evidence Advanced Forensic Biology	Teacher Coordinator & Teacher	1 2
IvI	Prof dr Zeno Geradts	Complex Crime Scenes	Teacher	1
KdVI	Prof dr Marjan Sjerps	Forensic Statistics and DNA Evidence	Teacher	1
	Dr Bert van Es	Forensic Statistics and DNA Evidence	Coordinator & Teacher	1
SILS	Dr Pernette Verschure	Advanced Forensic Biology	Teacher	2

MFS course coordination and contribution from CLHC coordinators and scientists in 2017

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The collaboration of the CLHC and the MFS ensures the incorporation of recent scientific developments and cutting-edge research into the master. The CLHC institutes also play an important role in providing interesting and challenging research project assignments for the Forensic Science master students during their 2nd year of the master. Of all literature theses and research projects roughly 50% is offered and supervised by CLHC partner institutes.

In this framework the CLHC aims to further strengthen the role and involvement of the forensic PhD students in the Forensic Science Master. Finally, it should be noted that a substantial forensic education effort is also undertaken for Bachelor and Master students in other areas than forensic science. Frequently, students outside the MFS conduct forensic literature studies and research projects offered by the CLHC. Details can be found in the Institute Annex to this annual report.

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PR, COMMUNICATION AND INTERNATIONAL NETWORK

Forensic science and criminal investigations usually attract a lot of attention from the general public and the media. Hence, a successful forensic science program within the University of Amsterdam can also be used to get society involved and interested in science and the activities of the university. This in turn can attract new generations of talented students to Amsterdam.

As the CLHC represents and coordinates the forensic science efforts at the UvA, the center is expected to create several outreach opportunities each year to promote science and interact with the general public. This includes forensic science presentations for a broad audience, articles in newspapers and popular scientific magazines and contributions on the Internet and television. Also in 2017 forensic research within the CLHC and associated CLHC featured in national media on several occasions. In the institute annex to the annual



The CLHC booth at IAFS 2017 in Toronto to support the bid for IAFS 2020 in Amsterdam



Interview on RTL Late Night (13-11-2017) on the forensic use of MA-XRF imaging

report all PR/Communication activities are listed including radio and TV interviews, press releases and popular scientific articles and presentations. The annex can be made available upon request.

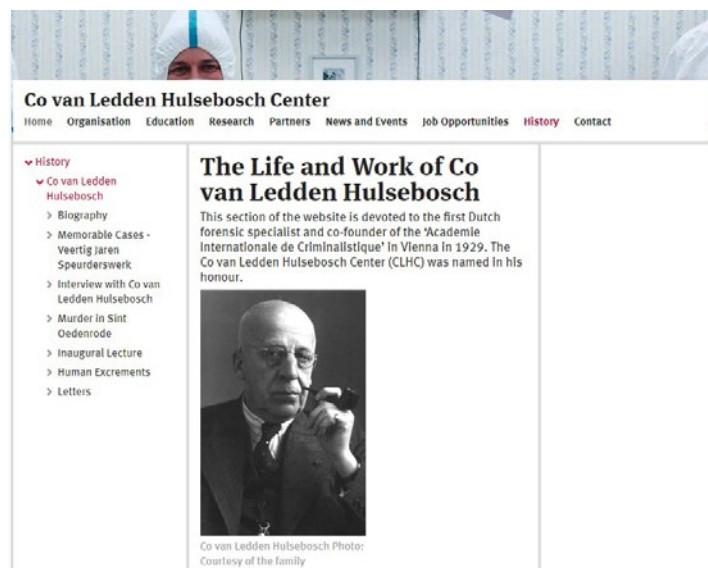


International network

In 2017 the CLHC continued to build its international network and the center presented itself to the international forensic community in a bid at the IAFS 2017 in Toronto to organize the IAFS 2020 in Amsterdam. Unfortunately, the bid was lost to UTS Sydney as the Amsterdam bid came in 2nd place. It remains the ambition of the CLHC to further develop the international network through institute collaborations and to be a trademark of forensic science in the Netherlands by contributing to international forensic science symposia and meetings. The CLHC will continue to pursue future options to organize and host a major international forensic science conference in Amsterdam.

The CLHC website

An important communication platform for internal and external use is the CLHC website (www.clhc.nl).



Co van Ledden Hulsebosch historic archive on the CLHC website

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Number of CLHC website visits per country in the period between October 1st 2017 and January 22nd 2018.

■ Netherlands	1.418
■ United States	142
■ India	79
■ Germany	51
■ United Kingdom	27
■ China	16
■ Belgium	13
■ Spain	10
■ Switzerland	8
Total	1.886

The CLHC web coordinator (Ineke Weijer) ensures that the site is a dynamic platform which provides the latest forensic scientific information both nationally and internationally. Information on the special chairs in forensic science, key publications and forensic PhD theses has been made available in the 'Research' section. Historic documents on the work and life of Co van Ledden Hulsebosch are digitized and made available with the help of the grandson of the forensic pioneer. Students can use the website to find suitable projects and thesis subjects in the 'Education' section which is constantly updated with new projects and topics.

The international partner page lists information of fellow academic centres in forensic science around the globe. It is the ambition of the CLHC to further develop the



The CLHC Facebook page

research section of the site and provide a clearer connection with the research and education activities of the associated institutes. This could further increase the value and use of the CLHC website. At the end of 2017 the CLHC website was visited on average 17 times a day of which 5 international visits. The 'Co van Ledden Hulsebosch Center' Facebook page features news and events which reach 200-1000 visitors per message. A 2017 highlight was the announcement of our bid in Toronto, which reached 1414 people.

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FINANCIAL

The CLHC holds a limited budget for its activities. Every year all associated FNWI institutes, the AMC and primary partner HvA provide a small financial contribution (1500 or 2500 euro) which add up to the annual CLHC budget (approximately 22 keuro). The CLHC expenses are relatively small because of the virtual nature of the institute and minimal overhead involved.

It should be noted that the CLHC does not fund research projects nor is directly responsible for such projects. This responsibility sits with the institutes and principal investigators. The CLHC means are used to create opportunities in terms of forensic research, forensic meetings, symposia and network and outreach activities to increase general interest and awareness of the overall forensic science efforts in in the Netherlands both nationally and internationally. The CLHC directors discuss progress and “return on investment” on a regular basis with the institute directors.

In 2017 most expenses were associated with the bid for IAFS 2020 that was presented at the end of August in Toronto at the IAFS 2017. The CLHC presented the bid in a conference booth and a special folder was made for

this occasion. In addition a special IAFS 2020 logo was designed. The overall costs of the endeavour accounts for roughly 40% of the total of 30 keuro of 2017 expenditures. With a balance of 13 keuro at the beginning of the year and expenses in total of 30 keuro, the CLHC budget at the end of 2017 was just over 5 keuro. It should be noted that the costs associated with hiring an NFI expert for 0.2 fte for the position of CLHC director on behalf of the Faculty of Science are not part of the CLHC budget. This is part of a separate financial arrangement between HIMS and the NFI. All financial details are given in the financial annual report of the center in a separate annex that can be made available on request. The annual financial reports of the CLHC are approved by the CLHC steering group.



INSTITUTE ACHIEVEMENTS AND HIGHLIGHTS



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In the institute annex all significant forensic achievements in 2017 is given. These results are specifically related and limited to the forensic science efforts. All projects and results have a strong forensic component but this also includes projects that are interdisciplinary in nature and cover a broader range of scientific areas.

In these instances, the forensic component should be clear and significant in terms of associated grants, financial contributions and/or scientific results. For some initiatives and new grants there is a strong forensic aspect but applied in new areas outside the traditional criminal justice system. These initiatives illustrate the potential of forensic science in Amsterdam and are strongly supported by the CLHC. The institute overviews have been prepared by the respective CLHC coordinators and illustrate the success of the matrix approach to establish a comprehensive forensic science program in Amsterdam. Highlights of 2017 obtained from these overviews are listed below. In a separate annex of the CLHC Annual Report a detailed overview of all forensic achievements in 2017 are listed for every institute.

The institute overviews have been prepared by the respective CLHC coordinators and associated scientists listed as co-authors of this annual report. Institute overviews can be requested by contacting the associated CLHC coordinators.

CLHC 2017 highlights from the Institute Annex:



- Prof dr Christianne de Poot gave her inaugural lecture at VU University entitled *The reconstruction of criminal activities*.
- PhD students Madeleine de Gruiter and Anna Mapes from the RAAK Pro project 'Beter Opsporen met het Lab op zak' successfully defended their PhD theses.
- PhD students Michael Woldegebriel and Andrei Barcaru from the Chromametrics project successfully defended their PhD theses.



- In total 8 PhD theses fully or partially devoted to forensic science were published in 2017, a new CLHC record.
- Two high impact papers were published by the IBED-SILS-NFI team working on methodology to accurately estimate the age of an unknown donor of biological stains as encountered during crime scene investigations.
- As a result of the ISFRI 2016 conference an important white paper was published on future directions in forensic radiology and imaging research. The paper is authored by an international team of leading forensic radiologists and pathologists.



- A substantial project was launched in which the Informatics Institute collaborates with the Dutch police to develop new scientific insights and methods for searching multimedia data in law enforcement. Three PhD students will start on the project and will conduct their research mostly within the police organization.
- A Marie Curie IFS project on the chemical characterization of pyrotechnics (Pyroprof) was granted by the EU leading to a post doc from Spain working on forensic science in the Netherlands.
- A new IBED project was funded in collaboration with KWR to develop waterwater based epidemiology methods to track and trace the dumping of waste from the illegal production of drugs of abuse.
- The Biomedical Physics and Engineering department of the AMC participated in a seed money project in the route Measurement and Detection of the National Science Agenda.



- Delft University launched a MOOC (Massive Open On-Line Course) on forensic engineering. This first ever MOOC on forensic science in the Netherlands was a big international success (see mini interview with Arjo Loeve in this report).



- Zeno Geradts (NFI/Informatics Institute) was nominated as President Elect of the American Academy of Forensic Science. With this nomination Zeno can become the first non-US scientist to be appointed president of this major (5000+ attendants) conference on forensic science.



- The official start of ARISTA, the first forensic cemetery in the Netherlands/Europe for the scientific study of human taphonomy to assist law enforcement and criminal investigations (see mini interview with Roelof Jan Oostra in this report). The launch of ARISTA yielded a lot of positive media attention.
- Media interest in a study on large area elemental XRF imaging in collaboration with the Rijksmuseum leading to an interview in the TV show *RTL Late Night* and an article in *the Volkskrant*.
- The design and development of a special nail clipper by Delft University to collect nail evidence from deceased victims leads to a radio interview on BNR News Radio and an on-line news article in the *NRC*.

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Mini Interview with ARISTA initiator - Roelof-Jan Oostra



Name: **Roelof-Jan Oostra**
Chair: **Clinical and Comparative
Morphology**
Faculty/University: **AMC**
Appointed since: **2008**

What is your passion and ambition in forensic science and medicine?

One of my ambitions was to raise the first human taphonomic facility in Europe and to make the body donation program of our department, traditionally exclusively meant for anatomical research and education, available for decomposition studies. Looking back on an 8 years long process, I am very pleased to see that this has been accomplished.

What are the aims and goals of the forensic cemetery at the AMC?

The aim is to provide a facility, in the most literal sense of the word, for any type of (forensic) remote-sensing or minimally invasive research that focusses on human decomposition. Ideally, these studies should be combined to make optimal use of the bodies and plots where they are buried.



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What taphonomic research is currently being conducted within ARISTA?

Presently three bodies are buried, two of which are used for entomological studies. The other one is mainly for testing remote-sensing techniques, including infrared and spectral cameras and ground-penetrating radar.

Is there international interest in the ARISTA initiative?

Yes there is, especially from groups residing in the UK and Germany, where legislation hampers the development of human taphonomic facilities.

What has been the response by the general public on the forensic cemetery?

Much to our relief both the general public and the donors themselves have been nothing but positive and understanding with respect to the use of bodies donated to science for decomposition studies.

Mini interview with Forensic Engineering MOOC initiator - dr Arjo Loeve



Name: **Arjo Loeve**
Faculty/University: **Mechanical, Maritime and Materials Engineering/ TU Delft**

What is your passion and ambition in forensic science and engineering?

From my background in medical engineering I see many parallels between our work in the medical field and in the forensic field:

- Change is often hard to accomplish (many rules and “we’ve done it like this for ages”),
- high-tech has much to offer, but also often makes things more complex and expensive,
- and, many seemingly simple problems prove to be very hard to solve effectively.

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And as we encounter very similar issues in these two fields, I really aim to make putting our engineering approach in forensics just as common as it is now in medicine: always getting to the core of the problem and aiming for the simplest solution... even though these are the hardest to find.

How many people followed and finished the MOOC in Forensic Engineering?

We had over 4500 enrolled learners, of which 279 finished the course (which is a very high percentage for a MOOC) and 160 purchased a certificate. We had learners aged 11 to 85 (median 29), with all kinds of backgrounds. We had lawyers, airplane pilots, nurses, police, students, forensic experts, and many more.

What was the response of the MOOC followers, did they appreciate the course?

Our MOOC got an 8.24 out of 10 in the post-course survey. Learners most liked the fact that they finally got to have a systematic approach to analysing failures, which also helped them to be better designers and to prevent failures in the future. By now, we even have hospitals saying they will provide our MOOC to their technical staff and nurses, as it helps them think outside the box and thoroughly investigate any adverse events, technology related as well as others.

Was there international interest in the MOOC on Forensic Engineering?

We had participants from 152 countries, so I guess that's a yes.

Will the MOOC Forensic Engineering be an annual event at the TU Delft?

We definitely made the MOOC for long-term use and plan to update the assignments yearly. This year the MOOC will start again October 16 ("Forensic Engineering: Learning from Failures" on edX.org) and then it will run continuously for half a year as a self-paced course (so you can do it at your own speed). And... we are currently working with the Reactor Institute Delft to add a module on Nuclear/Radiological Forensic Engineering to our MOOC for the 2019 run.

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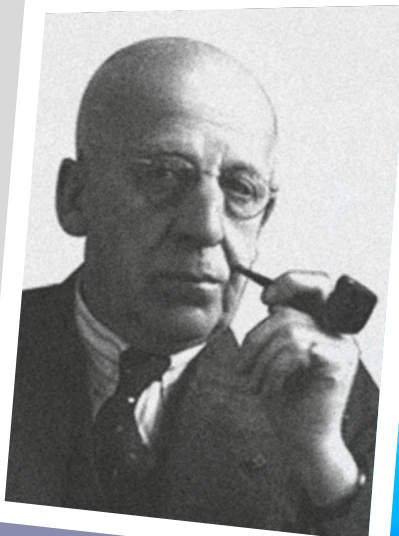
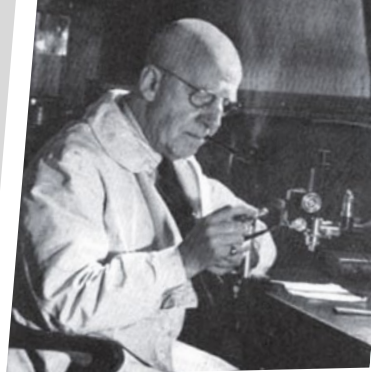


Colophon

Co van Ledden Hulsebosch Center
*Amsterdam Center for Forensic Science
and Medicine*

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