

BOARD OF TRUSTEES

UNIVERSITY OF THE DISTRICT OF COLUMBIA

UDC Resolution 2019 -

SUBJECT: UDC School of Engineering & Applied Sciences Tenure Approval for Dr. Ludwig Nitsche

WHEREAS, pursuant to 8B DCMR §1467, the School of Engineering & Applied Sciences (SEAS) Promotion Committee and Dean Devdas Shetty have determined that Dr. Ludwig Nitsche, Professor of Mechanical Engineering, is qualified to receive tenure; and

WHEREAS, pursuant to 8B DCMR §1462, Dr. Nitsche meets the criteria for tenure having served in various capacities such as the Associate Dean for Undergraduate Affairs, interim department head, as well as the Director of Undergraduate Studies and Associate Professor at the College of Engineering at the University of Illinois at Chicago, and was granted tenure from the Board of Trustees of the University of Illinois in 1996; and

WHEREAS, Dr. Nitsche has a distinguished record of teaching courses that include Fluid Mechanics, Chemical Engineering Thermodynamics, Junior Transport Phenomena II (Heat and Mass Transfer), Senior Chemical Process Control, Graduate Transport Phenomena, Mathematical Methods in Chemical Engineering, Graduate Micro-hydrodynamics, Diffusion and Membrane Transport, Computational Methods in Chemical Engineering, Introduction to Flow in Porous media, Graduate Numerical Methods in Chemical Engineering and was substantiated by numerous awards such as UIC award of Excellence in teaching in 2014, UIC College of Engineering Harold A. Simon Award for Excellence in Teaching, 2012, UIC College of Engineering 2008 Faculty Teaching Award., UIC CETL 2007 Teaching Recognition Program Award, UIC College of Engineering 2006 Faculty Teaching Award; and

WHEREAS, Dr. Nitsche is recognized for his research awards such as NSF Research Initiation Award, ACS Petroleum Research Fund Type G grant, 1994 NSF Young Investigator (NYI) Award, Grants and contracts from National Science Foundation and Argonne National Laboratory, 1999 Fulbright scholar award, US Patent on manufacturing of drug-delivery particles via drop fluid mechanics; and

WHEREAS, Dr. Nitsche' s service is recognized by his contribution to engineering accreditation through ABET by the web-based student assessment method and was adopted by engineering college-wide at the University of Illinois Chicago; and

WHEREAS, pursuant to 8B DCMR §§ 1468 and 1470 the Dean, the Chief Academic Officer and the President have affirmed the recommendation of tenure for Dr. Ludwig Nitsche and the President has forwarded the recommendation for tenure to the Board of Trustees.

NOW, THEREFORE BE IT RESOLVED that the Board of Trustees of the University of the District of Columbia approves the award of tenure to Dr. Ludwig Nitsche of the School of

Engineering & Applied Sciences.

Submitted by the Academic and
Student Affairs Committee:

November 6, 2019

Approved by the Board of Trustees:

November 19, 2019

Christopher Bell, Esq.
Chairperson of the Board

UNIVERSITY OF THE
DISTRICT OF COLUMBIA
OFFICE OF THE CHIEF ACADEMIC OFFICER

Lawrence T. Potter, Jr., Ph.D.
Chief Academic Officer

CONFIDENTIAL MEMORANDUM

TO: Ronald Mason, Jr., J.D.
President

FROM: 
Lawrence T. Potter, Jr., Ph.D.
Chief Academic Officer

DATE: October 11, 2019

RE: Dr. Ludwig Nitsche recommendation for tenure

Dear President Mason:

Guided by the *Seventh Master Agreement*, I have reviewed the materials and other supporting documentation of Dr. Nitsche for the award of tenure—an applicant holding the rank professor in the School of Engineering and Applied Sciences (SEAS). *It should be noted that Dr. Nitsche was awarded the rank of professor upon hiring on August 16, 2019. His dossier was reviewed by SEAS faculty who hold the rank of professor within the Department of Mechanical Engineering, the Department Chair, and the Dean, Dr. Devdas Shetty, for the granting of tenure. Therefore, this recommendation meets all University policies.*

I have reviewed Dr. Nitsche's dossier for tenure to evaluate evidence of significant and relevant achievements in scholarship/creative work, teaching, and service in tandem with the standards outlined in the *Seventh Master Agreement*. I arrived at my independent assessment of Dr. Nitsche's work after careful consideration of his record of teaching, scholarly artifacts, service contributions, and peer-evaluations.

Dr. Nitsche holds a Ph.D. from the Massachusetts Institute of Technology and an impressive academic background. His undergraduate degree is in chemical engineering and mathematics from the University of Minnesota; he completed a post-doctoral fellowship at the University of Cambridge before joining the University of Illinois, Chicago, in 1991. Dr. Nitsche was tenured and promoted to associate professor of engineering at the University of Illinois, Chicago, on July 11, 1996.

Scholarship: Dr. Nitsche has been recognized for his research awards by the National Science Foundation (NSF), ACS Petroleum Research Fund as well as grants and contracts from NSF and Argonne National Laboratory. He is the recipient of a 1999 Fulbright Scholar Award, 1994 NSF Young Investigator Award, and holds a US Patent on the manufacturing of drug-delivery particles via drop fluid mechanics. He has authored or co-authored more than thirty peer-reviewed publications in refereed journals or scientific publications; and, he has served as Co-PI or PI or more than seventeen federally-funded projects exceeding \$3M.

Teaching: Dr. Nitsche has distinguished himself as a very competent and accessible professor who students (both undergraduate and graduate) find themselves drawn to when study complex issues and problems. His teaching excellence has been supported by many teaching awards that include University of Illinois, Chicago Award of Excellence in Teaching (2014), UIC College of Engineering Harold A. Simon Award for Excellence in Teaching (2012), UIC College of Engineering Faculty Teaching Award (2008), UIC Center for Excellence in Teaching and Learning Recognition Program Award (2007). Dr. Nitsche has developed a range of undergraduate and graduate course offerings, advised undergraduate Honors theses, masters and doctoral students, and implemented innovative teaching pedagogies to increase minority participation from students of color in engineering. His most impressive teaching and advising have happened in the area of undergraduate student research where many of his students have commented about the care, personal attention, and clarity he has given to them.

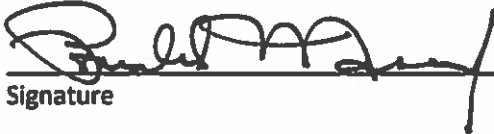
Service: Dr. Nitsche has dedicated his entire professional teaching and administrative career to enhancing STEM education for underrepresented students as well as making lasting contributions to engineering accreditation through ABET by creating web-based assessment measures that track student learning outcomes. These efforts have been recognized by professional organizations and universities as groundbreaking. As Associate Dean, Interim Department Head, and Director of Undergraduate Studies in the College of Engineering at UIC, he served on several departmental and college-level committees (e.g., Faculty Search Committees, Graduate Committee, Undergraduate Committee, Computer Committee, etc.).

Lastly, Dr. Nitsche has the qualifications, background, and experience to be tenured as a member of the engineering faculty at the University of the District of Columbia. I strongly support the faculty, DEPC, Dean, and external peer-recommendations to award Dr. Nitsche's tenure in the School of Engineering and Applied Sciences based on exemplary academic record in teaching, scholarly activities, and service to the professional and beyond.

Enclosure: Tenure recommendation and supporting document for Dr. Ludwig Nitsche

I, Ronald Mason, Jr., President of the University of the District of Columbia, do hereby

APPROVE DENY the recommendation for granting tenure to Dr. Ludwig Nitsche and will recommend approval to the Board of Trustees.


Signature

10.25.19
Date

Comments: _____

THE BOARD OF TRUSTEES
UNIVERSITY of ILLINOIS

352 Henry Administration Building, MC-350
506 South Wright Street
Urbana, Illinois 61801
(217) 333-1920

July 12, 1996

Ludwig C. Nitsche
Department of Chemical Engineering
920 SEO M/C 110
University of Illinois at Chicago

I am pleased to inform you that, on July 11, 1996, the Board of Trustees of the University of Illinois approved a recommendation that you be promoted to the rank of Associate Professor of Chemical Engineering on indefinite tenure effective September 1, 1996.

Promotion in academic rank brings recognition not only to you but also to the University of Illinois. It clearly indicates your commitment to high standards of performance in teaching, research, and service, and it represents the University's investment in attracting and nurturing a highly qualified and productive faculty. The Trustees are pleased that you have elected to pursue your scholarly activities at the University of Illinois and hope that you will find this setting very satisfactory for some time to come.

On behalf of the members of the Board of Trustees, I extend sincere congratulations and best wishes to you.

Michèle M. Thompson

Michèle M. Thompson
Secretary, Board of Trustees

c. Office of Academic Human Resources
College of Engineering
Department of Chemical Engineering

September 23, 2019

Devdas Shetty, Ph.D., P.E.
Dean, School of Engineering and Applied Science
Professor of Mechanical Engineering,
University of the District of Columbia
4200 Connecticut Ave. NW
Washington, DC 20008
Phone: 202-274-5033
Email: devdas.shetty@udc.edu

RE: Letter of application for tenure at UDC.

Dear Dean Shetty,

On the basis of my current academic record, I request to be considered for tenure at the University of the District of Columbia. In 1996 I had been granted tenure with my promotion to Associate Professor of Chemical Engineering at the University of Illinois at Chicago (UIC). A scan of the official notification letter from the Board of Trustees of the University of Illinois is appended under Section 5. Among other qualifications detailed in my Curriculum Vitae (Section 2), that promotion and tenure had factored in my first 7 refereed research publications and 4 further refereed papers in various stages of acceptance to production, 29 conference presentations, 3 research grants as PI and one conference grant as co-PI. These grants included an NSF Young Investigator (NYI) Award – equivalent to the current NSF CAREER Award and the first among Chemical Engineering faculty at UIC.

PI on NSF Research Initiation Award. Grant number: CTS-9210277. Budget: \$91,680.

PI on ACS Petroleum Research Fund Type G grant. Grant number: ACS-PRF# 28439-G9. Budget: \$20,000.

PI on 1994 NSF Young Investigator (NYI) Award. Grant number: CTS-9457039. Budget: \$135,895.

Co-PI on NSF conference grant. Grant number CTS-9525791. Budget: \$8,300. Supporting package of corporate sponsorships and donations: approximately \$3,500.

At that time my teaching record included 2 courses taught under UIC's old quarter system:

ChE 234 ¹	Junior	Fluid Mechanics
ChE 331 ²	Junior	Chemical Engineering Thermodynamics

and 5 semester courses:

ChE 312	Junior	Transport Phenomena II (Heat and Mass Transfer)
ChE 341	Senior	Chemical Process Control
ChE 410	Graduate	Transport Phenomena
ChE 445	Graduate	Mathematical Methods in Chemical Engineering
ChE 512 ³	Graduate	Microhydrodynamics, Diffusion and Membrane Transport

The Microhydrodynamics course was developed newly by me and fulfilled the advanced transport phenomena requirement for the PhD in chemical engineering.

Academic Record Since Tenure at UIC

Since attaining tenure at UIC, my research record includes 21 further refereed publications and 13 new grants and subcontracts from the National Science Foundation and Argonne National Laboratory, distributed as follows (Section 4):

- \$ 101,229 as sole PI
- \$ 779,575 as PI, together with other co-PIs
- \$1,780,709 as co-PI

These developments are detailed in Section 2.2 ("Summary CV Since Tenure at University of Illinois at Chicago"). My 2019 paper [31] in the *Journal of Pharmaceutical Sciences* (with coauthors J. M. Nitsche and G. B. Kasting) on diffusion of drugs and chemicals through skin was selected by the journal's editorial team to be highlighted on the *J. Pharm Sci.* website as a Feature for 30 days, and subsequently under the Free Virtual Issue tab for 3 months (Virtual Issue: Most Original and Most Significant Findings). This recognition is documented in two emails from the Editor in Chief (Section 3). Research with my UIC colleague Dr. Ying Liu and her group that led to four papers [24] [25], [27], [30] on manufacturing of drug-delivery particles via drop fluid also also resulted in the issue of a US patent (#8,852,645).

I received a Fulbright Senior Scholar Award (#9498, October 1999 to January 2000) for research in Austria (documented in Section 2.3) and 5 awards for excellence in teaching (Section 7):

- UIC Award for Excellence in Teaching, 2014.
- UIC College of Engineering Harold A. Simon Award for Excellence in Teaching, 2012.
- UIC College of Engineering 2008 Faculty Teaching Award.
- UIC CETL 2007 Teaching Recognition Program Award.
- UIC College of Engineering 2006 Faculty Teaching Award.

¹ Equivalent to the semester course ChE 311

² Equivalent to the semester course ChE 301

³ First offered as a topics course under ChE 594. (ChE 512 is the permanent course number.)

I supervised 2 PhD degrees and 3 MS degrees, and also co-supervised 1 further MS degree. Since 1996 I taught 12 distinct courses at a load of 1 or 2 courses per semester, tapering off with my administrative appointments as Interim Head and Associate Dean.

ChE 201	Sophomore	Introduction to Thermodynamics
ChE 205	Sophomore	Computational Methods in Chemical Engineering
ChE 311	Junior	Transport Phenomena I (Fluid mechanics)
ChE 312	Junior	Transport Phenomena II (Heat and Mass Transfer)
ChE 341	Senior	Chemical Process Control
ChE 397	Senior	Senior Design II
ChE 410	Graduate	Transport Phenomena
ChE 413	Graduate	Introduction to Flow in Porous media
ChE 431	Graduate	Numerical Methods in Chemical Engineering
ChE 433	Graduate	Process Simulation with Aspen Plus
ChE 445	Graduate	Mathematical Methods in Chemical Engineering
ChE 512	Graduate	Microhydrodynamics, Diffusion and Membrane Transport

New courses developed by me in the post-tenure period included ChE 413 (Introduction to Flow in Porous Media) and two computational courses: ChE 205 (Computational Methods in Chemical Engineering) and ChE 433 (Process Simulation With Aspen Plus). These qualifications are detailed in Attachment #3: "CV Since Last Personnel Action."

I also took on significant administrative responsibilities at UIC:

- Director of Undergraduate Studies, Department of Chemical Engineering (8/2005-5/2014)
- Interim Head, Department of Chemical Engineering (6/2014 – 8/2015)
- Associate Dean for Undergraduate Affairs, College of Engineering (8/2015-8/2019)

Although at a different institution, my administrative efforts at UIC served to advance general interests that align with the mission and vision of the University of the District of Columbia and current priorities of Operational Readiness, Customer Service, Technological Upgrades, and Student Support. These activities are described below.

Leadership in assessment and ABET accreditation. As DUGS in the Chemical Engineering department, I had responsibility for coordinating assessment and preparations for the 2008 and 2014 ABET accreditation cycles. For both of these ABET site visits I programmed a complete web-based presentation and archival system in HTML/CSS. The ABET Final Statements for 2008 and 2014 contained no deficiencies, concerns, weaknesses or observations. The 2008 statement concluded that, *"The assessment plan is mature and well documented. The director of undergraduate studies is to be commended for his efforts in organizing the assessment data and serving as the department 'champion' to steer the assessment process."* The 2014 statement mentioned that *"The program personnel who are providing leadership for the assessment of the undergraduate program have developed comprehensive documentation and processes. The organization of the materials both in the self-study report and on-site materials was very professional and detailed."*

In my capacity of Associate Dean at UIC, I scaled up this approach to a unified, college-wide digital system for archiving and presenting curriculum portfolios and assessment data for all Engineering departments. For this purpose, I recruited and hired a Teaching Associate staff member to develop and maintain a faculty-usable- member to develop and maintain a faculty-usable, SharePoint-based, FERPA-compliant web system. I also work extensively with the departmental DUGS's and the Director of Assessment on planning and implementation of assessment methodologies and multi-level analysis of data. Finally, I liaised with the UIC Office of Assessment on graduate program assessment, worked directly with all six departmental Directors of Graduate Study and helped coordinate the IBHE (Illinois Board of Higher Education) accreditation of graduate programs in Engineering.

Here at UDC I have already made significant progress on a SEAS-wide ABET accreditation web portal for use by all four departments.

Diversity mission in higher education. As co-chair of the college-level Diversity Committee from 2008-2014, I led formulation, administration and analysis of a climate assessment survey, liaised with the university Diversity Strategic Thinking and Planning Committee, and worked with faculty, staff and students to complete a Diversity Strategic Plan for the college and its constituent departments. From 2005-2014 I served as the Chemical Engineering departmental Facilitator for the university-level WISE (Women in Science and Engineering) Committee. These efforts included working with intra- and inter-college colleagues to (1) research literature in social sciences on unconscious bias and best practices in hiring, (2) positively influence university faculty-affairs policies in tangible ways, and (3) develop and present search committee workshops with material and approach that university administration later adopted beyond the STEM fields. I have worked with the Director of Minority Affairs in the college to reformulate outreach, recruitment and scholarship programs toward improved yield. I regularly participate in outreach events at feeder community colleges. As PI of a \$600K NSF S-STEM scholarship grant in the Chemical Engineering department, I planned and managed recruitment, selection, mentoring and tracking for 59 scholarship students. These efforts increased the representation of women among our undergraduate student body. More recently I was co-PI of an ongoing, \$1M, college-level S-STEM scholarship grant that provides holistic academic and mentoring support for academically talented, low income students. I also served on the Faculty Advisory Board for the campus-wide PAP STEM Initiative: Presidential Award Program of scholarships and holistic mentoring and research experience for students within underrepresented groups.

Leadership in curricular and programmatic innovations. As chair of the Educational Policy Committee (EPC), I worked with the Directors of Undergraduate Studies (DUGS) in all Engineering departments and liaised with the Dean, Department Heads and higher administration to bring new and modified courses as well as revisions to degree programs to fruition within university rules, procedures and standards. In my previous capacity as departmental DUGS in Chemical Engineering, I developed two new computational courses (ChE 205 – Computational Methods in Chemical Engineering; ChE 433 – Aspen Plus Process Simulation) as well as a Professional Development Seminar (ChE 499) for graduating seniors. I also spearheaded the undergraduate program changes to make ChE 205 and ChE 499 bachelor's degree requirements, and taught these courses for several years. These developments represented

continuous-improvement contributions to the curriculum, based upon feedback from alumni and our Industrial Advisory Board and also faculty discussions. I have devoted much effort to developing relationships with the departments of Sociology and History on inter-college STEM intersections with their curricula. This has come to fruition with STEM-based modules in two courses in Sociology last year and a History course this spring semester. My dedication to student learning and efforts toward effective and improved teaching have led to receiving the UIC Award for Excellence in Teaching, CETL (Council on Excellence in Teaching and Learning) Teaching Recognition Program Award, the college-level Harold Simon Excellence in Teaching Award and two further teaching awards.

Hands-on student learning. I served on the planning committee for the UIC Engineering student MakerSpace, which brought this facility from construction nearing completion to full functionality in November 2016. Planning activities included formulating policies for students and safety, chairing the search committee for the Associate Director of the MakerSpace, and assignment of office and work space to the student professional organizations. The MakerSpace currently operates under my administrative and budget oversight, and its Associate Director reports to me. As a faculty member working in collaboration with MakerSpace personnel, I drafted the official course outlines for the MakerSpace certification courses (ENGR 111/112 – Engineering Practicum in Additive/Subtractive Manufacturing). As chair of the Educational Policy Committee (EPC) I facilitated the administrative approval and launching of these courses, which have proven popular with our undergraduates.

Capstone design experience. I recruited and hired a Teaching Associate staff member to rejuvenate organization and management of the annual Engineering EXPO. Her efforts have been widely recognized and include development of a SharePoint-based web management system for students, faculty and administration.

Experience in faculty affairs. In my 14-month stint as Interim Head of the Chemical Engineering department, I had administrative responsibility for hiring 2 tenure-track assistant professors and 3 non-tenure-track faculty members. I also prepared the papers for one (successful) tenure case. Other efforts included managing course assignments for department faculty, modernizing the Unit Operations teaching laboratory, and securing facilities support for faculty with laboratory research programs.

Study abroad, international initiatives and distance education. I have served as a member of the UIC Internationalization Task Force and continue serving as a member of the Academic Quality Assurance Committee (AQAC), which oversees and reports to the main UIC Global steering committee on program curriculum, admissions/progression criteria, student conduct, and academic support for international students. These efforts also include (1) presenting engineering lectures to visiting international student groups, (2) introducing a hands-on MakerSpace course experience for incoming international students to boost their motivation, and (3) representing the UIC Engineering college on a UIC Global delegation during a 10-day recruiting trip to Vietnam and Burma in fall 2017. Liaising with the Director of Online Education and Distance Education, I coordinated with the EPC to convert the course catalog of UIC's Master of Engineering Online program from departmental courses to the new, dedicated MENG rubric.

Finally, I was the college-level point of contact for students seeking study abroad opportunities. In this capacity I regularly (1) met individually with undergraduates to plan course work at foreign universities; and (2) liaised with the Study Abroad office and academic departments on approval of foreign transfer credits.

Intra- and inter-institutional relations and collaborations. Aside from the campus committees and offices mentioned above, I have collaborated with colleagues in the departments of Biological Sciences, Educational Psychology, Sociology, Chemistry, Chemical Engineering, Mechanical and Industrial Engineering, and Electrical and Computer Engineering on multiple educational and institutional grant proposals. I maintained relationships with administration and faculty at the top feeder community colleges for UIC, including providing assistance to the Office of Academic and Enrollment Services and the Office of the Registrar in negotiating Transfer Admission Guarantee agreements and also liaising on inter-institutional grant proposals.

Data-driven decisions and strategic planning. For monthly reporting to the Administrative Council (consisting of the Dean, Department Heads, Associate Deans, Directors), I developed perspicuous new metrics to track recruiting, inform admissions criteria, and thereby enable strategic enrollment and capacity planning. In this effort I carried out extensive VBA programming to enable a standardized data-mining procedure that is now routinely implemented by the Admissions Director.

Supervision of personnel and management of budgets. Personnel under my direct supervision as Associate Dean for Undergraduate Affairs at UIC included Directors and Associate Directors of (1) Admissions and Records, (2) Minority Affairs and MERRP (Minority Recruitment and Retention Program), (3) WIEP (Women in Engineering Programs), (4) MakerSpace, (5) Educational Assessment, and (6) Student Organizations. Their direct reports include 3 Assistant Directors (academic advisors), 2 administrative assistants, 8 graduate student employees and 9 undergraduate student employees. I also managed a Teaching Associate staff member and two Administrative Assistants. In addition to oversight of hiring, professional development, performance evaluation, and policies, I also made salary and promotion recommendations to the Dean for all staff in the Undergraduate Office. Factoring in management of the MERRP and WIEP programs, student recruiting, student organizations and the MakerSpace, my direct budget oversight amounted to approximately \$870,000 annually. This entailed detailed collaboration with all Directors and Associate Directors and recommendations discussed with the Dean for his final approval.

I hope that the record of teaching, research and service described above and in the accompanying attachments will be suitable for expedited approval of tenure at UDC. With best regards I remain,

Respectfully Yours,



Ludwig C. Nitsche
Associate Dean, SEAS
Professor of Mechanical Engineering

Attachments

- Section 2. Curriculum Vitae**
- Section 3. Representative Publications**
- Section 4. Representative Grant Information**
- Section 5. Proof of Previous Tenure**
- Section 7. Prior Teaching Evaluation Information**



Department of Mechanical Engineering
School of Engineering and Applied Sciences
4200 Connecticut Avenue, N.W.
Building 42/Suite 213
Washington, DC 20008
Phone: 202.274.5126
Fax: 202.274.6232

To,
Prof. Devdas Shetty
Dean of School of Engineering & Applied Sciences
University of the District of Columbia

Oct 7th, 2019

Sub: Application for tenure for Dr. Nitsche.

Dear Dean. Shetty,

On behalf of the Mechanical Engineering DEPC, I want to inform you that the DEPC has met and discussed about Dr. Nitsche's application package for tenure. The Mechanical Engineering DEPC has therefore recommended that tenure to be granted to Dr. Nitsche.

This recommendation is based on the following observations:

1. In 1996 Dr. Nitsche had been granted tenure with my promotion to Associate Professor of Chemical Engineering at the University of Illinois at Chicago (UIC). Dr. Nitsche holds a Ph.D from MIT and an impressive background academically as well as administratively. Dr. Ludwig C. Nitsche was the Associate Dean for Undergraduate Affairs, College of Engineering at the University of Illinois at Chicago. He held various faculty positions at the University of Illinois, Chicago as well as administrative positions. Besides being department head, he held positions of interim department head, as well as the Director of Undergraduate Studies.
2. **Research and Scholarships:** The testimony for his research comes from several research grants and awards he had received. At the time of his tenure at UDC, he had published 7 refereed research publications and 4 further refereed papers in various stages of acceptance to production, 29 conference presentations, 3 research grants as PI and one conference grant as co-PI. These grants included an NSF Young Investigator (NYI) Award—equivalent to the current NSF CAREER Award and the first among Chemical Engineering faculty at UIC. National Science Foundation and Argonne National Laboratory grant,

Fulbright scholar award in 1999, US Patent on manufacturing of drug-delivery particles via drop fluid. He has supervised graduate students at Masters and PhD level. Since attaining tenure at UIC, his research record includes 21 further refereed publications and 13 new grants and subcontracts from the National Science Foundation and Argonne National Laboratory, distributed as follows:

\$ 101,229 as sole PI

\$ 779,575 as PI, together with other co-PIs

\$1,780,709 as co-PI

His 2019 paper [31] in the Journal of Pharmaceutical Sciences (with coauthors J. M. Nitsche and G. B. Kasting) on diffusion of drugs and chemicals through skin was selected by the journal's editorial team to be highlighted on the J. Pharm Sci. website as a Feature for 30 days, and subsequently under the Free Virtual Issue tab for 3 months (Virtual Issue: Most Original and Most Significant Findings). This recognition is documented in two emails from the Editor in Chief (Section 3). Research with his UIC colleague Dr. Ying Liu and her group that led to four papers on manufacturing of drug-delivery particles via drop fluid also resulted in the issue of a US patent (#8,852,645).

3. **Teaching:** He has distinguished record of teaching courses that include Fluid Mechanics, Chemical Engineering Thermodynamics, Junior Transport Phenomena II (Heat and Mass Transfer), Senior Chemical Process Control, Graduate Transport Phenomena, Mathematical Methods in Chemical Engineering, Graduate Micro-hydrodynamics, Diffusion and Membrane Transport, Computational Methods in Chemical Engineering, Introduction to Flow in Porous media, Graduate Numerical Methods in Chemical Engineering. Specifically, he has developed the following courses at UIC:

ChE 2341 Junior Fluid Mechanics

ChE 3312 Junior Chemical Engineering Thermodynamics and 5 semester courses:

ChE 312 Junior Transport Phenomena II (Heat and Mass Transfer)

ChE 341 Senior Chemical Process Control

ChE 410 Graduate Transport Phenomena

ChE 445 Graduate Mathematical Methods in Chemical Engineering

ChE 5123 Graduate Microhydrodynamics, Diffusion and Membrane Transport

As chair of the Educational Policy Committee (EPC), Dr. Nitsche worked with the Directors of Undergraduate Studies (DUGS) in all Engineering departments and liaised with the Dean, Department Heads and higher administration to bring new and modified courses as well as revisions to degree programs to fruition within university rules, procedures and standards. In his previous capacity as departmental DUGS in Chemical Engineering, I developed two new computational courses (ChE 205 – Computational Methods in Chemical Engineering; ChE 433 – Aspen Plus Process Simulation) as well as a

Professional Development Seminar (ChE 499) for graduating seniors. I also spearheaded the undergraduate program changes to make ChE 205 and ChE 499 bachelor's degree requirements, and taught these courses for several years. His dedication to student learning and efforts toward effective and improved teaching have led to receiving the UIC Award for Excellence in Teaching, CETL (Council on Excellence in Teaching and Learning) Teaching Recognition Program Award, the college-level Harold Simon Excellence in Teaching Award and two further teaching awards.

4. **Services:** He is heavily involved in University service. His contribution to engineering accreditation through ABET is well documented. These include development of a web-based student assessment method that was adopted college-wide by University of Illinois Chicago. In his capacity of Associate Dean at UIC, he scaled up this approach to a unified, college-wide digital system for archiving and presenting curriculum portfolios and assessment data for all Engineering departments. For this purpose, I recruited and hired a Teaching Associate staff member to develop and maintain a faculty-usable- member to develop and maintain a faculty usable, SharePoint-based, FERPA-compliant web system. I also work extensively with the departmental DUGS's and the Director of Assessment on planning and implementation of assessment methodologies and multi-level analysis of data. Finally, I liaised with the UIC Office of Assessment on graduate program assessment, worked directly with all six departmental Directors of Graduate Study and helped coordinate the IBHE (Illinois Board of Higher Education) accreditation of graduate programs in Engineering. Here at UDC he has already made significant progress on a SEAS-wide ABET accreditation web portal for use by all four SEAS departments.

Therefore, on behalf of the Mechanical Engineering DEPC, I submit the recommendation that Dr. Nitsche should be considered for tenure here at UDC.

Sincerely,



Jiajun Xu, Ph.D., P.E.
Associate Professor
Chair of the Mechanical Engineering DEPC
Department of Mechanical Engineering
School of Engineering & Applied Sciences
University of the District of Columbia

Devdas Shetty, Ph.D., PE, Dean/Professor
Office of the Dean
School of Engineering and Applied Sciences
Email: devdas.shetty@udc.edu

October 6, 2019

Recommendation for Dr. Ludwig Nitsche for Tenure at the University of the District of Columbia

Dr. Ludwig Nitsche holds a Ph. D from MIT and an impressive background academically as well as administratively. He had his undergraduate degree in Chemical Engineering and Mathematics from the University of Minnesota and finished an NSF-NATA Postdoctoral fellowship at the University of Cambridge before joining the University of Illinois, Chicago in 1991.

Dr. Nitsche was the Associate Dean for Undergraduate Affairs, College of Engineering at the University of Illinois at Chicago. He held various faculty positions at the University of Illinois, Chicago as well as administrative positions. He held positions of interim department head, as well as the Director of Undergraduate Studies. In 1996 Dr. Nitsche was granted tenure. (A scan of the official notification letter from the Board of Trustees of the University of Illinois is attached)

Dr Nitsche has exemplified in the areas of teaching, research and scholarly activities as well as service to the University as well as broader community.

Teaching

He has distinguished record of teaching courses that include Fluid Mechanics, Chemical Engineering Thermodynamics, Junior Transport Phenomena II (Heat and Mass Transfer), Senior Chemical Process Control, Graduate Transport Phenomena, Mathematical Methods in Chemical Engineering, Graduate Micro-hydrodynamics, Diffusion and Membrane Transport, Computational Methods in Chemical Engineering, Introduction to Flow in Porous media, Graduate Numerical Methods in Chemical Engineering.

His teaching excellence had been supported by many teaching awards that include, UIC award of Excellence in teaching in 2014, UIC College of Engineering Harold A. Simon Award for Excellence in Teaching, 2012, UIC College of Engineering 2008 Faculty Teaching Award., UIC CETL 2007 Teaching Recognition Program Award. UIC College of Engineering 2006 Faculty Teaching Award.

Research and Service

The testimony for his research comes from several research grants and awards he had received. He had been a PI on NSF Research Initiation Award, ACS Petroleum Research Fund Type G grant, 1994 NSF Young Investigator (NYI) Award, Grants and contracts from National Science Foundation and Argonne National Laboratory, 1999 Fulbright scholar award, US Patent on manufacturing of drug-delivery particles via drop fluid mechanics.

He has supervised graduate students at master's and PhD level. He is heavily involved in University service. His contribution to engineering accreditation through ABET is well documented. These include development of a web-based student assessment method and was adopted by engineering college-wide at the University of Illinois Chicago

The external referee Dr. John L. Anderson, President Emeritus and Distinguished Professor Illinois Institute of Technology and the current President of the National Academy of Engineering says, *"Dr. Ludwig's administrative strengths are his intelligence, responsiveness, attention to detail and respect for others. If he is in charge, nothing will fall through the cracks and he will do a thorough job in whatever task faces him. His personality is reserved, but he does stand firm when challenged. Through his current position, he is experienced in the duties demanded by the position of associate dean. The position at UDC is a positive career move for him."*

Dr. Sangtae Kim, Ph.D. Distinguished Professor and Head from Purdue University says, *"I have noted that he approaches these responsibilities with the same level of dedication that has been the hallmark of his scholarship. With all these attributes in mind, I can give him the highest possible endorsement for the associate deanship at UDC. His appointment would be especially appropriate for an institution with an ambitious agenda for both education and research in the Engineering/SEAS landscape"*

Dr. Ludwig Nitsche has the qualification, background and experience to secure a tenured position at University of the District of Columbia. I strongly support his case for tenure at the University of the District of Columbia.

Kind regards,



Devdas Shetty, Ph.D., P.E.
Dean,
School of Engineering and Applied Science
Professor of Mechanical Engineering
University of the District of Columbia
4200 Connecticut Ave. NW
Washington, DC 20008 Tel: 202 274 5033

Devdas Shetty, Ph.D., P.E.
Dean, School of Engineering and Applied Science
University of the District of Columbia
4200 Connecticut Ave. NW
Washington, DC 20008
Phone: 202-274-5033
Email: devdas.shetty@udc.edu

October 7, 2019

Subject: Recommendation Letter for Dr. Nitsche's Tenure

Dear Dean Shetty,

I have reviewed the extensive supporting documentation provided for the Tenure Application of Dr. Ludwig C. Nitsche. I conclude that Dr. Nitsche presents a very strong record in all aspects of Professorship (Teaching, Scholarship and Service) and would be a great asset to retain at UDC. Seeing that Dr. Nitsche first obtained his Tenure Appointment from University of Illinois, Chicago (UIC) in 1996, I will focus on his outstanding record since then.

Dr. Nitsche has maintained current in the field of Chemical Engineering, which most closely relates to Mechanical Engineering curriculum at UDC. Dr. Nitsche has experience teaching 14 different courses at both the graduate and undergraduate level, including:

ChE 234 Junior Fluid Mechanics
ChE 201 Sophomore Introduction to Thermodynamics
ChE 205 Sophomore Computational Methods in Chemical Engineering*
ChE 311 Junior Transport Phenomena I (Fluid mechanics)
ChE 331 Junior Chemical Engineering Thermodynamics
ChE 312 Junior Transport Phenomena II (Heat and Mass Transfer)
ChE 341 Senior Chemical Process Control
ChE 397 Senior Senior Design II
ChE 410 Graduate Transport Phenomena
ChE 413 Graduate Introduction to Flow in Porous media*
ChE 431 Graduate Numerical Methods in Chemical Engineering
ChE 433 Graduate Process Simulation with Aspen Plus*
ChE 445 Graduate Mathematical Methods in Chemical Engineering
ChE 512 Graduate Microhydrodynamics, Diffusion and Membrane Transport*

The four courses designated with an asterisk (*) were developed by Dr. Nitsche specifically for the UIC Chemical Engineering Program. Dr. Nitsche is a spearhead for hands-on student learning with his involvement in Senior Capstone and software/experimentation heavy courses. Currently he is teaching Fluid Mechanics and has been engaging the students with software modules since day 1. His 5 teaching awards and recent teaching evaluations have proven the

effectiveness in his methods with an average rating of 4.4/5.0. Additionally, he had served on the planning committee for the MakerSpace at his previous institution and will bring great insight as we embark on planning our MakerSpace here at UDC.

Dr. Nitsche is a dedicated Scholar as well, with over 30 peer-reviewed publications in reputable journals such as the *Journal of Fluid Mechanics* and one US patent. He is still actively doing research and publishing papers. Before his tenure, Dr. Nitsche obtained an NSF Young Investigator Award and an NSF Research Initiation Award. In 1999, Dr. Nitsche received a Fullbright Senior Scholar Award to perform research in Austria and has since his tenure at UIC obtained 13 grants totaling over \$2.5M. I have no doubt that Dr. Nitsche will find avenues of collaboration and fruitful research with faculty in the ME department and beyond.

During his Tenure at UIC, Dr. Nitsche undertook significant service and administrative responsibilities, including: Director of Undergraduate Studies, Department of Chemical Engineering (8/2005-5/2014); Interim Head, Department of Chemical Engineering (6/2014 – 8/2015); and most recently Associate Dean for Undergraduate Affairs, College of Engineering (8/2015-8/2019). Through his appointment as Director of Undergraduate Studies for ChE, Dr. Nitsche had great responsibility for coordinating assessment and preparations for two ABET cycles in 2008 and 2014—both of which passed with flying colors with specific credit given to the professionalism of his efforts in organizing the assessment data and serving to steer the assessment process. These attributes and experience will be invaluable to SEAS as we navigate our upcoming accreditation. Most recently in his capacity as Associate Dean, he created a college-wide system for archiving and presenting curriculum portfolios and assessment data. This similar approach we will be implementing in SEAS with Dr. Nitsche's assistance and he has already made great progress with our ABET web portal. Dr. Nitsche also served as a liaison to coordinate the Illinois Board of Higher Education accreditation for graduate programs. With this experience I have no doubt Dr. Nitsche will contribute greatly to the growth and success of the new graduate programs in SEAS.

It is for the above-mentioned reasons, I firmly support the tenure of Dr. Ludwig C. Nitsche.

Sincerely,



Kate L. Klein, Ph.D.
Associate Professor & Department Chair
Mechanical Engineering
University of the District of Columbia
(202) 274-7131
kate.klein@udc.edu



June 18, 2019

Devdas Shetty, Ph.D., P.E.
Dean, School of Engineering and Applied Science
University of the District of Columbia
4200 Connecticut Ave. NW
Washington, DC 20008

Dear Dean Shetty:

I am writing to support the application of Dr. Ludwig Nitsche for Associate Dean of Engineering at UDC. I have known Ludwig mainly through our research interests for almost 30 years. More recently I spoke with him about administrative leadership at a university; currently he is Associate Dean of Engineering for Undergraduate Affairs at the University of Illinois in Chicago.

Considering academic attributes, Ludwig is superior to many of his colleagues. He has worked with the best in fluid dynamics and held more than his own. His mathematical skills are superior, and he has a good sense of physical phenomena. His publications are first rate.

Ludwig's administrative strengths are his intelligence, responsiveness, attention to detail and respect for others. If he is in charge, nothing will fall through the cracks and he will do a thorough job in whatever task faces him. His personality is reserved, but he does stand firm when challenged. Through his current position, he is experienced in the duties demanded by the position of associate dean. The position at UDC is a positive career move for him.

The Associate Dean generally leads accreditation processes. In this respect, you will find Ludwig invaluable. His attention to detail, his knowledge of engineering education and ABET requirements (including those for computer science), and his high standards for teaching and research will insure the best possible outcome for your college. The same can be said for his work with curricular matters at both the undergraduate and graduate levels. I have no first-hand knowledge of his experience with faculty promotions, but I imagine he would be rigorous and fair.

I was Dean of Engineering at Carnegie Mellon University for eight years. I would have been very pleased to have Ludwig Nitsche as my Associate Dean. I definitely recommend him to you for this position.

Sincerely,

John L. Anderson
President Emeritus and Distinguished Professor
Illinois Institute of Technology
Phone: 312-613-7112
Email: johna@iit.edu

June 13, 2019

Prof. Devdas Shetty, Ph.D., P.E.
Dean
Professor of Mechanical Engineering,
School of Engineering and Applied Science
University of the District of Columbia
4200 Connecticut Ave. NW
Washington, DC 20008

Re: Professor Ludwig Nitsche

Dear Prof . Shetty:

I am writing this to strongly the application of Professor Nitsche for Associate Dean at UDC. I have known Ludwig for some thirty years, 25 years as a colleague at University of Illinois at Chicago (the last ten of those years as Department Head). Just to summarize Ludwig is what a Department Head prays for as faculty members, and from what I have been told as Associate Deans to from colleagues at UIC (I left UIC five years ago to join Illinois Institute of Technology, Chicago)

As a faculty member Ludwig contributed significantly to curriculum development in the department. He coordinated to several NSF proposals on Undergraduate Student Research. In addition he improved the curriculum of several undergraduate and graduate classes. For example in the undergraduate Process Control class, which students find particularly difficult because of the abstract nature of the material taught, he introduced several simple experiments to explain these abstract concepts. He also developed an outstanding website for the course, which records many of his lectures as well. As a result of his creative efforts, students find it much easier to understand abstract concepts in many of his classes. He has made similar improvements in many other classes at the undergraduate and graduate levels. He was also the PI (with me and others as co-PI) of an NSF S-STEM grant to increase the participation of women in Chemical Engineering. In addition as the Director of Undergraduate Studies during my tenure as Head he was able the help triple the UG enrolment in the Department, while the average ACT scores also improved.

As an Associate Dean at UIC he also initiated many new initiatives, which I am sure he has documented, so I will not repeat them. Under his supervision, all departments in the College got full ABET accreditation.

Ludwig has been an outstanding advisor, and an example of this was his advising an M.S. student who had a background in biology. Ludwig took additional time to mentor the student through many difficulties and deserves special recognition for his efforts. In addition, Ludwig has participated in Project Lead the Way in which he is helping high school teachers present engineering to their students. This is a tremendous contribution to our field that also deserves recognition.

In summary I think if you are successful in recruiting him the quality of both education and student support at UDC will improve significantly. I cannot think anyone would be able a better join for your open position.

Sincerely Yours

A. Murad

Sohail Murad

Professor and Chair

Sangtae Kim, PhD
Distinguished Professor
Jay and Cynthia Ihlenfeld Head of School
Email: kim55(at)Purdue.edu

July 12, 2019

Dr. Devdas Shetty
Dean, School of Engineering and Applied Sciences
University of the District of Columbia
4200 Connecticut Avenue NW
Washington, DC 20008

Dear Dean Shetty:

I am pleased to provide this letter of reference to support the application of Ludwig C. Nitsche to the position of Associate Dean in the School of Engineering and Applied Sciences at UDC. I have known Dr. Nitsche since the 1980s when he first came to the attention of the world as a brilliant PhD student in Howard Brenner's research group at MIT. Indeed, prior to that, in his senior year at Minnesota (then the #1 ranked chemical engineering department) he was actively recruited by many of the top programs in chemical engineering in addition to MIT. With that auspicious start to his career continued to the present, I consider him to be one of the of the deepest thinkers in the world of viscous fluid mechanics and transport phenomena.

Over the course of his career, Dr. Nitsche has added significant administrative responsibilities that go beyond his teaching and research activities, both at the departmental level and in the college of engineering. In my visits to Chicago, I have noted that he approaches these responsibilities with the same level of dedication that has been the hallmark of his scholarship. With all these attributes in mind, I can give him the highest possible endorsement for the associate deanship at UDC. His appointment would be especially appropriate for an institution with an ambitious agenda for both education and research in the Engineering/SEAS landscape.

Sincerely,



Sangtae Kim, Ph.D.
Distinguished Professor and Head
Fellow, American Institute for Medical and Biological Engineering
Fellow, American Institute for Chemical Engineers
Member, National Academy of Engineering (since 2001)

Section 2. Curriculum Vitae

2.1. Cumulative, current CV.

2.2. Summary CV since tenure at University of Illinois at Chicago (1996).

2.3. Documentation of USIA Fulbright Senior Scholar Program, Award #9498 (Austria, Research, 10/1999 – 1/2000).

Curriculum Vitae
Ludwig Carlos Nitsche, Ph.D.

Education.

NATO Postdoctoral Fellowship (1989-1990), Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge, UK. Advisor: Professor E. J. Hinch.

Ph.D. in Chemical Engineering (1989), Massachusetts Institute of Technology. Advisor: Professor Howard Brenner. Thesis title: "Multiphase Flow Through Spatially Periodic Models of Porous Media."

B.Ch.E. (With High Distinction, 1984) and B.Math (With High Distinction, 1984), University of Minnesota. Baccalaureate grade-point average: 3.98 / 4.00.

Languages.

English: mother tongue
Spanish: functional to fluent
German: fluent

Academic and administrative* appointments since the PhD.

8/2019 – Current	*Associate Dean, SEAS, University of the District of Columbia Professor of Mechanical Engineering
8/2015 – 8/2019	*Associate Dean for Undergraduate Affairs, College of Engineering, UIC
6/2014 – 8/2015	*Interim Head, Department of Chemical Engineering, UIC
8/2005 – 5/2014	*Director of Undergraduate Studies, Department of Chemical Engineering, UIC
9/1996 – Current	Associate Professor of Chemical Engineering, UIC
9/1991 – 8/1996	Assistant Professor of Chemical Engineering, UIC
1/1990 – 8/1991	Visiting Assistant Professor of Chemical Engineering, UIC
9/1989 – 12/1990	NSF-NATO Postdoctoral Fellow, DAMTP, University of Cambridge, UK
6/1989 – 8/1989	Postdoctoral Associate, Department of Chemical Engineering, MIT

Honors and awards.

- (9) UIC Award for Excellence in Teaching, 2013-2014.
- (8) UIC College of Engineering Harold A. Simon Award for Excellence in Teaching, 2011-2012.
- (7) UIC College of Engineering 2008 Faculty Teaching Award.
- (6) UIC CETL 2007 Teaching Recognition Program Award.
- (5) UIC College of Engineering 2006 Faculty Teaching Award.
- (4) USIA Fulbright Senior Scholar Program, Award #9498 (Austria, Research, 10/1999 – 1/2000).
- (3) National Science Foundation Young Investigator (NYI) Award, 1994-1999.
- (2) NSF-NATO Postdoctoral Fellowship, awarded February 1989.
- (1) NSF Graduate Fellowship Award, 1984-1987.

Courses taught at UIC. Asterisk (*) indicates that LCN was originator of new course.

ChE 201	Sophomore	Introduction to Thermodynamics
ChE 205*	Sophomore	Computational Methods in Chemical Engineering
ChE 301	Junior	Chemical Engineering Thermodynamics
ChE 311	Junior	Transport Phenomena I (Fluid mechanics)
ChE 312	Junior	Transport Phenomena II (Heat and Mass Transfer)
ChE 341	Senior	Chemical Process Control
ChE 397	Senior	Senior Design II
ChE 410	Graduate	Transport Phenomena
ChE 413*	Graduate	Introduction to Flow in Porous media
ChE 431	Graduate	Numerical Methods in Chemical Engineering
ChE 433*	Graduate	Process Simulation With Aspen Plus
ChE 445	Graduate	Mathematical Methods in Chemical Engineering
ChE 512*	Graduate	Microhydrodynamics, Diffusion and Membrane Transport

Articles in preparation.

[34] R. G. Henriquez Rivera and L. C. Nitsche, "Flying into the fog: A variational method for Fourier extension of the third kind and implications for interpolation with radial basis functions." Manuscript in preparation for submission to *J. Comput. Phys.*

[33] L. C. Nitsche, G. B. Kasting and J. M. Nitsche, "Physics-based algorithms for the diffusion velocity method in multiphase systems: Adaptive range finding, boundary corrections and particle redistribution." Manuscript in preparation for submission to *J. Comput. Phys.*

Publications in refereed journals. Asterisk (*) indicates papers co-authored with faculty colleagues in the UIC Chemical Engineering department.

[32] I. L. Molnar, E. Pensini, Md A. Asad, C. A. Mitchell, L. C. Nitsche, L. J. Pyrak-Nolte and M. M. Krol (2019), Colloid Transport in Porous Media: A Review of Classical Mechanics and Emerging Topics, *Transp. Porous Media*, In Press. DOI: 10.1007/s11242-019-01270-6

[31] L. C. Nitsche, J. M. Nitsche and G. B. Kasting (2019), Microscopic Models of Drug/Chemical Diffusion Through the Skin Barrier: Effects of Diffusional Anisotropy of the Intercellular Lipid, *J. Pharm. Sci.*, 108, 1692-1712. DOI: 10.1016/j.xphs.2018.11.014

[30*] P. Leon Plata, Y. Liu and L. C. Nitsche (2018), Interaction of Multiple Drops and Formation of Toroidal-Spiral Particles, *Phys. Rev. Fluids*, 3, 093601. DOI: 10.1103/PhysRevFluids.3.093601

[29*] A. Aljehani, S. A. K. Razackc, L. Nitsche, S. Al-Hallaj (2018), Design and optimization of a hybrid air conditioning system with thermal energy storage using phase change composite, *Energy Conversion & Management*, 169, 404–418. DOI: 10.1016/j.enconman.2018.05.040

- [28] L. C. Nitsche and B.A. Bernal (2018), Stokes flow singularity at a corner joining solid and porous walls at arbitrary angle, *J. Eng. Math.*, 108, 1–23. DOI: 10.1007/s10665-017-9901-2
- [27*] V. Sharma, M. Köllmer, M. Szymusiak, L. C. Nitsche, R. A. Gemeinhart and Y. Liu (2014), Toroidal Spiral Particles for Codelivery of Anti-VEGFR-2 Antibody and Irinotecan: A Potential Implant to Hinder Recurrence of Glioblastoma Multiforme, *Biomacromolecules*, 15, 756–762. DOI: 10.1021/bm401550r
- [26] L. C. Nitsche and P. Parthasarathi (2012), Stokes flow singularity at the junction between impermeable and porous walls. *J. Fluid Mech.*, 713, 183–215. DOI:10.1017/jfm.2012.454
- [25*] M. Szymusiak M, V. Sharma V, L. C. Nitsche and Y. Liu (2012), Interaction of sedimenting drops in miscible solution – formation of heterogeneous toroidal-spiral particles. *Soft Matter*, 8, 7556–7559 (2012). DOI: 10.1039/c2sm25928a
- [24*] V. Sharma, M. Szymusiak, H. Shen, L. C. Nitsche, and Y. Liu (2012), Formation of polymeric Toroidal-spiral particles, *Langmuir*, 28, 729–735. DOI: 10.1021/la203338v
- [23*] Y. Lei, J. Jelic, L. C. Nitsche, R. Meyer and J. Miller (2011), Effect of Particle Size and Adsorbates on the L3, L2 and L1 X-ray Absorption Near Edge Structure of Supported Pt Nanoparticles, *Topics in Catalysis*, 54, 334–348. DOI 10.1007/s11244-011-9662-5
- [22] L. C. Nitsche and P. Parthasarathi (2010), Cubically Regularized Stokeslets for Fast Particle Simulations of Low-Reynolds-Number Drop Flows, *Chem. Eng. Commun.*, 197, 18–38. DOI: 10.1080/00986440903070809
- [21*] N. S. Parkar, B. S. Akpa, L. C. Nitsche, L. E. Wedgewood, M. S. Sverdllov, O. Chaga and R. D. Minshall (2009), Vesicle formation and Endocytosis: Function, machinery, Mechanisms, and Modeling (Forum Review Article), *Antioxidants & Redox Signaling*, 11, 1301–1312. DOI: 10.1089/ars.2008.2397
- [20] L. C. Nitsche (2006), Accurate asymptotic formulas for the transient PDF of a FENE dumbbell in suddenly started uniaxial extension followed by relaxation. *J. Non-Newtonian Fluid Mech.*, 135, 109–116. DOI: 10.1016/j.jnnfm.2006.01.008
- [19*] L. C. Nitsche, W. Zhang and L. E. Wedgewood (2006), Asymptotic basis of the L-closure for finitely extensible dumbbells in suddenly started uniaxial extension. *J. Non-Newtonian Fluid Mech.*, 133, 14–27. DOI:10.1016/j.jnnfm.2005.10.004
- [18] L. C. Nitsche, A. Nguyen and G. Evans (2004), Globally cohesive drops without interfacial tension. *Chem. Phys. Lett.*, 397, 417–421. DOI:10.1016/j.cplett.2004.09.006

- [17*] S. Murad and L. C. Nitsche (2004), The effect of thickness, pore size and structure of a nanomembrane on the flux and selectivity in reverse osmosis separations: a molecular dynamics study. *Chem. Phys. Lett.*, 397, 211–215. DOI:10.1016/j.cplett.2004.08.106
- [16] L. C. Nitsche, G. Machu and W. Meile (2004), Wavelets and fast summations for particle simulations of gravitational flows of miscible drops. *Computers Chem. Eng.*, 28, 1873–1879. DOI :10.1016/j.compchemeng.2004.03.001
- [15] L. C. Nitsche and W. Zhang (2002), Atomistic SPH and a link between diffusion and interfacial tension. *AIChE Journal*, 48, 201–211. DOI: 10.1002/aic.690480203
- [14] L. C. Nitsche and U. Schaflinger (2001), A swarm of Stokeslets with interfacial tension. *Phys. Fluids.*, 13, 1549–1553. DOI: 10.1063/1.1369124
- [13] G. Machu, W. Meile, L. C. Nitsche and U. Schaflinger (2001), Coalescence, torus formation and break-up of sedimenting drops: experiments and computer simulations. *J. Fluid Mech.*, 447, 299–336. DOI: 10.1017/S0022112001005882
- [12] L. C. Nitsche and E. J. Hinch (1997), Shear-induced lateral migration of Brownian rigid rods in parabolic channel flow. *J. Fluid Mech.*, 332, 1–21. DOI: 10.1017/S0022112096003369
- [11] L. C. Nitsche (1996), Fluctuation-flipping orbits of freely-draining dumbbells in converging-diverging pore flows. *Chem. Eng. Commun.*, 148-150, 593–621. DOI: 10.1080/00986449608936535
- [10] L. C. Nitsche, (1996). One-dimensional stretching functions for patched grids, and associated truncation errors in finite-difference calculations. *Commun. Numer. Methods. Eng.*, 12, 303–316. DOI: 10.1002/(SICI)1099-0887(199605)12:5<303
- [9] L. C. Nitsche (1996), Cross-stream migration of bead-spring polymers in nonrectilinear pore flows. *AIChE Journal*, 42, 613–622. DOI: 10.1002/aic.690420303
- [8] L. C. Nitsche (1995), A singular perturbation analysis of antipolarization dialysis at high aspect ratio. *Ind. Eng. Chem. Research*, 34, 3590–3605. DOI: 10.1021/ie00037a049
- [7] L. C. Nitsche and S. Zhuge (1995), Hydrodynamics and selectivity of antipolarization dialysis. *Chem. Eng. Sci.*, 50, 2731–2746. DOI: 10.1016/0009-2509(95)00041-3
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- [5] L. C. Nitsche (1994), Pseudo-sedimentation dialysis: an elliptic transmission problem. *Quart. Appl. Math.*, LII, 83–102. DOI: 10.1090/qam/1262321

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- [3] L. C. Nitsche and H. Brenner (1990), Hydrodynamics of particulate motion in sinusoidal pores via a singularity method. *AIChE Journal*, 36, 1403–1419. DOI: 10.1002/aic.690360913
- [2] L. C. Nitsche and H. Brenner (1989), Eulerian kinematics of flow through spatially periodic models of porous media. *Arch. Rational Mech. Anal.*, 107, 225–292. DOI: 10.1007/BF01789610
- [1] L. C. Nitsche, J. M. Nitsche and H. Brenner (1988), Existence, uniqueness and regularity of a time-periodic probability density distribution arising in a sedimentation-diffusion problem. *SIAM J. Math. Anal.*, 19, 153–166. DOI: 10.1137/0519012

Other technical publications.

L. C. Nitsche, Appendix: Refined model with sphere-sphere interactions and leading-order wall effects (pp. 358–361) in: R. Zenit and M. L. Hunt, The impulsive motion of a liquid resulting from a particle collision, *J. Fluid Mech.* 375, 345–361 (1998).

L. C. Nitsche, Book Review (Microhydrodynamics: Principles and Selected Applications. By Sangtae Kim and Seppo J. Karrila, Butterworth-Heinemann, Boston, 1991, 507+xxiii pp.), *AIChE Journal*, 40, 739–743 (1994).

L. C. Nitsche, A new lift for centrifugal impellers? *Chem. Eng. Progress*, 87, 73–79 (1991).

Patent issued.

L. C. Nitsche and Y. Liu, Self-assembled toroidal-spiral particles and manufacture and uses thereof, *US Patent 8,852,645*, Issued October 7, 2014.

Grants from external funding agencies.

(17) L. C. Nitsche, Co-PI: “NSF INCLUDES: A Community Centered Approach to Improving STEM Pathways for Underrepresented Students.” NSF-SES 1649298. Period: 10/01/2016 – 9/30/2018. Budget: \$299,972. (Joint with PI: K. Lawless and co-PIs: J. Abiade, A. Alfonso and D. Wink.)

(16) L. C. Nitsche, Co-PI, “An Integrated Program for Recruitment, Retention, and Graduation of Academically Talented Low Income Engineering Students.” NSF-DUE 1644182. Period: 07/01/2017 – 06-30/2022. Budget: \$999,096. (Joint grant with PI: H. Darabi and other Co-PIs: R. Revelo Alonso, J. Abiade and P. C. Nelson.)

(15) L. C. Nitsche, Co-PI, "Toroidal-spiral particles (TSPs) for co-delivery of multiple compounds of different sizes." NSF-DMR 1404884. Period: 08/01/2014 – 07/31/2017. Budget: \$390,000. (Joint grant with PI: Y. Liu and other Co-PI: R. Gemainhart.)

(14) L. C. Nitsche, PI, "Midwest Thermodynamics and Statistical Mechanics (MTSM) Conference." NSF-CBET . Period: 05/01/2014 – 04/30/2015. Budget: \$10,000. (Co-PI: S. Murad.)

(13) L. C. Nitsche, PI, "Collaborative Research: GOALI: Multiscale Theory and Computer Simulation of Skin Absorption Phenomena." NSF-CBET 1335869. Period: September 1, 2013 - August 31, 2016. Budget: \$101,229. (Partner investigators and institutions: J. M. Nitsche, State University of New York at Buffalo; G. B. Kasting, University of Cincinnati.)

(12) L. C. Nitsche, PI, "Scholarship Program for Women in Chemical Engineering." NSF-DUE 1060198. Period: September 1, 2012 – August 31, 2017. Budget: \$599,766. (Joint grant with Co-PIs: S. Murad, L. E. Wedgewood, P. C. Nelson and G. A. Smith.)

(11) L. C. Nitsche, Co-PI, "EAGER: Preliminary Study on Novel self-assembled Toroidal-Spiral MicroParticles (TSMPs) for sustained release of therapeutic proteins and peptides: theory and experiments." NSF-CBET 1039531. Period: September 1, 2010 – August 31, 2012. Budget: \$65,688. (Joint grant with PI: Y. Liu.)

(10) L. C. Nitsche, Co-PI, "GILEE: Establishing a Graduate Interdisciplinary Liberal Engineering Ethics Curriculum." NSF-DBI 0832738. Period: August 15, 2008 – August 14, 2011. Budget: \$49,999. (Joint grant with PI: S. Murad and other Co-PI: L. E. Wedgewood.)

(9) L. C. Nitsche, PI, "Aspen Modeling of Thermochemical Cycles." Argonne National Laboratory Subcontract 9J-30282, Period: 05/03/2010 – 9/30/2011. Budget: \$33,209. (Joint grant with Co-PI: L. E. Wedgewood.)

(8) L. C. Nitsche, PI, "Evaluation of Three Related Forms of a Copper-Chlorine Thermo-Chemical Cycle for Hydrogen Production." Argonne National Laboratory Subcontract continuation. Period: 9/15/2006 – 12/30/2007. Budget: \$55,000. (Joint grant with Co-PI: L. E. Wedgewood.)

(7) L. C. Nitsche, PI, "Evaluation of Three Related Forms of a Copper-Chlorine Thermochemical Cycle for Hydrogen Production." Argonne National Laboratory Subcontract 6F-00251. Period: 05/15/2006 – 09/15/2006. Budget: \$42,000. (Joint grant with Co-PI: L. E. Wedgewood.)

(6) L. C. Nitsche, PI, "Economic analysis of a desalination process using zeolite membranes." Subcontract from New Mexico Institute of Mining and Technology. Period: 1/01/2005 – 05/31/2006. Budget: \$30,000.

(5) L. C. Nitsche, USIA Fulbright Senior Scholar Program, 1999-2000, Award #9498: Austria, Research. Budget: ATS 125,000 (approximately \$9,600).

(4) L. C. Nitsche and J. M. Nitsche, PIs on NSF conference grant administered through UIC. Award date: 07/01/1995. Grant number CTS-9525791. Budget: \$8,300. Supporting package of corporate sponsorships and donations: approximately \$3,500.

(3) L. C. Nitsche, PI, 1994 NSF Young Investigator (NYI) Award; Grant number: CTS-9457039. Period: 09/01/1994 – 08/31/1999. Budget: \$135,895.

(2) L. C. Nitsche, PI, ACS-Petroleum Research Fund Type G grant: "Nonlinear Hydrodynamic Drift Effects in Microporous Transport of Colloids and Macromolecules." Grant number: ACS-PRF# 28439-G9. Period: 9/01/1994 – 8/31/1996. Budget: \$20,000.

(1) L. C. Nitsche, PI, NSF Research Initiation Award: "Antisedimentation Dialysis: Fundamentals and Applications in Membrane Characterization, Fractionation of Macrosolutes, and Simulation of Microgravity." Grant number: CTS-9210277. Period: 06/01/1992 – 11/30/1995. Budget: \$91,680.

Symposia / technical sessions organized / chaired: 13.

Representative presentations at technical conferences (51 cumulative).

L. C. Nitsche (Speaker), R. G. Henriquez Rivera, P. Leon Plata and Y. Liu, "Shape Evolution of Miscible Drops with Arbitrary Viscosity Ratio: Lagrangian-Eulerian Swarms of Stokeslets and Subgrid Resolution" (Presentation 444b). AIChE 2017 Annual Meeting, Minneapolis, Minnesota October 29 – November 3, 2017.

L. C. Nitsche (Speaker), J. M. Nitsche and G. B. Kasting, "Microscopic Diffusion Model and Particle-Based Computer Simulations of Stratum Corneum Permeability" (Invited Talk, 1473), InterPore 2016 – 8th International Conference on Porous Media & Annual Meeting, Cincinnati, Ohio, May 9-12, 2016.

L. Pyrak-Nolte, E. Boomsma and L. C. Nitsche (Speaker), "Wall effects in the sedimentation of micro- and nano-particulate swarms within fractures: combined insights from experiments and computer simulations" (Talk 1050), InterPore 2016 – 8th International Conference on Porous Media & Annual Meeting, Cincinnati, Ohio, May 9-12, 2016.

J. M. Nitsche (Speaker), L. C. Nitsche and G. B. Kasting, "A New Microscopic Model of Permeability and Lateral Diffusion in the Stratum Corneum Barrier Layer of Skin" Paper 571h, AIChE 2014 Annual Meeting, Atlanta, GA, November 16-21, 2014.

L. C. Nitsche (Speaker), J. M. Nitsche and G. B. Kasting, "Modeling of Diffusion in Stratified Epithelia Using Smoothed Particle Hydrodynamics" (Presentation 549i). AIChE 2013 Annual Meeting, San Francisco, CA, November 3-8, 2013.

- Chair, Educational Policy Committee, AY 2006-07, 2007-08, 2010-11
- Member, Educational Policy Committee, AY 1998-99, 2005-06, 2008-09 through 2013-14.
- Member, Engineering Physics Review Committee, Spring 1995; AY 1995-96.
- Member, Review Committee for the Norman Parker and Paul M. Chung (student) awards, Spring 1995.
- University Committees
 - Departmental Facilitator, WISE (Women in Science and Engineering Committee), AY 2005-06 through 2013-2014
- Other service activities
 - UIC Affiliate Professor, Project Lead the Way (Secondary educational outreach), 2005-2006. www.pltw.org
 - Fellow of the Honors College, AY 1994-95, 1995-96, 1996-97, 2006 to current
 - Technical Judge for Engineering Expo, Spring 1994, Spring 1996.
 - Four lectures on applied mathematics and differential equations as part of EIT review sessions administered by Tau Beta Pi: Fall 1993, Fall 1995, Spring 1997, Spring 1998.
 - Reviewer of manuscripts for *J. Fluid Mech.*, *J. Non-Newtonian Fluid Mech.*, *Phys. Fluids*, *Int. J. Multiphase Flow*, *Int. J. Heat Mass Transfer*, *J. Eng. Math.*, *AIChE J.*, *Indust. Eng. Chem. Res.*, *Chem. Eng. Sci.*, *Power Technol.*, *Comput. Chem. Eng.*, *Rheol. Acta*, *I&EC Research*,
 - Reviewer of grant proposals for the National Science Foundation (12 review panels since 2005) and the ACS Petroleum Research Fund.

L. C. Nitsche (Speaker) and B. Bernal, "Asymptotic Theory and Numerical Analysis for Unraveling the Stokes Flow Singularity At the Junction Between Solid and Porous Walls With Arbitrary Wedge Angle" (Presentation 368a) AIChE 2013 Annual Meeting, San Francisco, CA, November 3-8, 2013.

L. C. Nitsche, (Speaker), C. J. Jameson and S. Murad, "Molecular Simulation and Hydrodynamic Characterization of Water in CNT's - Influence of Electric Fields on Wetting and Infiltration" (Presentation 574g). AIChE 2005 Annual Meeting, Cincinnati, Ohio, October 30 – November 4, 2005.

L. C. Nitsche (Speaker), A. Nguyen and G. Evans, "Secondary Cohesion and Chemical Potential Models for Diffuse Interfaces" (Presentation 124e). AIChE 2005 Annual Meeting, Cincinnati, Ohio, October 30 – November 4, 2005.

Graduate research students

Prashanth Parthasarathi	PhD	Summer 2008
Javier Rios	MS	Summer 2006
Olga Jedry	MS	Fall 2005
Tejas Shah	MS	Spring 2005 (co-advised with S. Murad)
Weidong Zhang	PhD	Spring 2004
Shan Zhuge	MS	Fall 1995

Service activities at University of Illinois at Chicago 1991-2014 (before Interim Department Head and Associate Dean appointments).

- Departmental committees and assignments.
 - ABET Accreditation Coordinator, AY 2006-07 through 2013-14
 - Chair, Faculty Search Committee, AY 1996-97.
 - Member, Faculty Search Committee, AY 1997-98, 2006-07
 - Director of Undergraduate Studies, AY 2005-06 through 2013-14
 - Chair, Undergraduate Committee, AY 1994-95, 1995-96, 1998-99, 2003-04, 2004-05.
 - Member, Undergraduate Committee, AY 1991-92, 1998-99, 2000-2001, 2001-02; Fall 2002.
 - Member, Graduate Committee, AY 1991-92, 1994-95, 1998-99.
 - Member, Departmental Advisory Committee, AY 1993-94, 2006-07, 2007-08, 2014-15, 2015-16, 2016-17.
 - Member, Shop, Lab, and Computer Committee, AY 1993-94.
 - Member, Computer Committee, AY 2000-01, 2001-02.
 - Seminar coordinator, AY 2005-06, 2006-07, 2007-08, 2008-09.
 - Timetable coordinator, AY 1993-94, 1994-95, 1995-96, 1996-97.
 - External Advisory Board Coordinator AY 2005-06 through 2013-14
 - Faculty advisor for AIChE student chapter 2006-07, 2007-08, 2012-13.
- College committees.
 - Co-Chair, Diversity Committee, AY 2008-9 through 2013-14.
 - Secretary, Educational Policy Committee, AY 1991-92, 1992-93.

Summary CV Since Tenure at UIC
Ludwig Carlos Nitsche, Ph.D.

Appointments since tenure at UIC.

8/2019 – Current	Associate Dean, SEAS, University of the District of Columbia Professor of Mechanical Engineering
8/2015 – 8/2019	Associate Dean for Undergraduate Affairs, College of Engineering, UIC
6/2014 – 8/2015	Interim Head, Department of Chemical Engineering, UIC
8/2005 – 5/2014	Director of Undergraduate Studies, Department of Chemical Engineering, UIC
9/1996 – 8/2019	Last Personnel Action at UIC: Associate Professor of Chemical Engineering with Tenure

Honors and awards.

- (9) UIC Award for Excellence in Teaching, 2014.
- (8) UIC College of Engineering Harold A. Simon Award for Excellence in Teaching, 2012.
- (7) UIC College of Engineering 2008 Faculty Teaching Award.
- (6) UIC CETL 2007 Teaching Recognition Program Award.
- (5) UIC College of Engineering 2006 Faculty Teaching Award.
- (4) USIA Fulbright Senior Scholar Program, Award #9498 (Austria, Research, 10/1999 – 1/2000).

Courses taught at UIC. Asterisk (*) indicates that LCN was originator of new course.

ChE 201	Sophomore	Introduction to Thermodynamics
ChE 205*	Sophomore	Computational Methods in Chemical Engineering
ChE 311	Junior	Transport Phenomena I (Fluid mechanics)
ChE 312	Junior	Transport Phenomena II (Heat and Mass Transfer)
ChE 341	Senior	Chemical Process Control
ChE 397	Senior	Senior Design II
ChE 410	Graduate	Transport Phenomena
ChE 413*	Graduate	Introduction to Flow in Porous media
ChE 431	Graduate	Numerical Methods in Chemical Engineering
ChE 433*	Graduate	Process Simulation With Aspen Plus
ChE 445	Graduate	Mathematical Methods in Chemical Engineering
ChE 512*	Graduate	Microhydrodynamics, Diffusion and Membrane Transport

Publications #12-32 in refereed journals. Asterisk (*) indicates papers co-authored with faculty colleagues in the UIC Chemical Engineering department.

- [32] I. L. Molnar, E. Pensini, Md A. Asad, C. A. Mitchell, L. C. Nitsche, L. J. Pyrak-Nolte and M. M. Krol (2019), Colloid Transport in Porous Media: A Review of Classical Mechanics and Emerging Topics, *Transp. Porous Media*, In Press. DOI: 10.1007/s11242-019-01270-6

- [31] L. C. Nitsche, J. M. Nitsche and G. B. Kasting (2019), Microscopic Models of Drug/Chemical Diffusion Through the Skin Barrier: Effects of Diffusional Anisotropy of the Intercellular Lipid, *J. Pharm. Sci.*, **108**, 1692-1712. DOI: 10.1016/j.xphs.2018.11.014
- [30*] P. Leon Plata, Y. Liu and L. C. Nitsche (2018), Interaction of Multiple Drops and Formation of Toroidal-Spiral Particles, *Phys. Rev. Fluids*, **3**, 093601. DOI: 10.1103/PhysRevFluids.3.093601
- [29*] A. Aljehani, S. A. K. Razackc, L. Nitsche, S. Al-Hallaj (2018), Design and optimization of a hybrid air conditioning system with thermal energy storage using phase change composite, *Energy Conversion & Management*, **169**, 404–418. DOI: 10.1016/j.enconman.2018.05.040
- [28] L. C. Nitsche and B.A. Bernal (2018), Stokes flow singularity at a corner joining solid and porous walls at arbitrary angle, *J. Eng. Math.*, **108**, 1–23. DOI: 10.1007/s10665-017-9901-2
- [27*] V. Sharma, M. Köllmer, M. Szymusiak, L. C. Nitsche, R. A. Gemeinhart and Y. Liu (2014), Toroidal Spiral Particles for Codelivery of Anti-VEGFR-2 Antibody and Irinotecan: A Potential Implant to Hinder Recurrence of Glioblastoma Multiforme, *Biomacomolecules*, **15**, 756–762. DOI: 10.1021/bm401550r
- [26] L. C. Nitsche and P. Parthasarathi (2012), Stokes flow singularity at the junction between impermeable and porous walls. *J. Fluid Mech.*, **713**, 183–215. DOI:10.1017/jfm.2012.454
- [25*] M. Szymusiak M, V. Sharma V, L. C. Nitsche and Y. Liu (2012), Interaction of sedimenting drops in miscible solution – formation of heterogeneous toroidal-spiral particles. *Soft Matter*, **8**, 7556–7559 (2012). DOI: 10.1039/c2sm25928a
- [24*] V. Sharma, M. Szymusiak, H. Shen, L. C. Nitsche, and Y. Liu (2012), Formation of polymeric Toroidal-spiral particles, *Langmuir*, **28**, 729–735. DOI: 10.1021/la203338v
- [23*] Y. Lei, J. Jelic, L. C. Nitsche, R. Meyer and J. Miller (2011), Effect of Particle Size and Adsorbates on the L3, L2 and L1 X-ray Absorption Near Edge Structure of Supported Pt Nanoparticles, *Topics in Catalysis*, **54**, 334–348. DOI 10.1007/s11244-011-9662-5
- [22] L. C. Nitsche and P. Parthasarathi (2010), Cubically Regularized Stokeslets for Fast Particle Simulations of Low-Reynolds-Number Drop Flows, *Chem. Eng. Commun.*, **197**, 18–38. DOI: 10.1080/00986440903070809
- [21*] N. S. Parkar, B. S. Akpa, L. C. Nitsche, L. E. Wedgewood, M. S. Sverdllov, O. Chaga and R. D. Minshall (2009), Vesicle formation and Endocytosis: Function, machinery, Mechanisms, and Modeling (Forum Review Article), *Antioxidants & Redox Signaling*, **11**, 1301–1312. DOI: 10.1089/ars.2008.2397

- [20] L. C. Nitsche (2006), Accurate asymptotic formulas for the transient PDF of a FENE dumbbell in suddenly started uniaxial extension followed by relaxation. *J. Non-Newtonian Fluid Mech.*, **135**, 109–116. DOI: 10.1016/j.jnnfm.2006.01.008
- [19*] L. C. Nitsche, W. Zhang and L. E. Wedgewood (2006), Asymptotic basis of the L-closure for finitely extensible dumbbells in suddenly started uniaxial extension. *J. Non-Newtonian Fluid Mech.*, **133**, 14–27. DOI:10.1016/j.jnnfm.2005.10.004
- [18] L. C. Nitsche, A. Nguyen and G. Evans (2004), Globally cohesive drops without interfacial tension. *Chem. Phys. Lett.*, **397**, 417–421. DOI:10.1016/j.cplett.2004.09.006
- [17*] S. Murad and L. C. Nitsche (2004), The effect of thickness, pore size and structure of a nanomembrane on the flux and selectivity in reverse osmosis separations: a molecular dynamics study. *Chem. Phys. Lett.*, **397**, 211–215. DOI:10.1016/j.cplett.2004.08.106
- [16] L. C. Nitsche, G. Machu and W. Meile (2004), Wavelets and fast summations for particle simulations of gravitational flows of miscible drops. *Computers Chem. Eng.*, **28**, 1873–1879. DOI :10.1016/j.compchemeng.2004.03.001
- [15] L. C. Nitsche and W. Zhang (2002), Atomistic SPH and a link between diffusion and interfacial tension. *AIChE Journal*, **48**, 201–211. DOI: 10.1002/aic.690480203
- [14] L. C. Nitsche and U. Schaflinger (2001), A swarm of Stokeslets with interfacial tension. *Phys. Fluids.*, **13**, 1549–1553. DOI: 10.1063/1.1369124
- [13] G. Machu, W. Meile, L. C. Nitsche and U. Schaflinger (2001), Coalescence, torus formation and break-up of sedimenting drops: experiments and computer simulations. *J. Fluid Mech.*, **447**, 299–336. DOI: 10.1017/S0022112001005882
- [12] L. C. Nitsche and E. J. Hinch (1997), Shear-induced lateral migration of Brownian rigid rods in parabolic channel flow. *J. Fluid Mech.*, **332**, 1–21. DOI: 10.1017/S0022112096003369

Other technical publication.

L. C. Nitsche, Appendix: Refined model with sphere-sphere interactions and leading-order wall effects (pp. 358-361) in: R. Zenit and M. L. Hunt, The impulsive motion of a liquid resulting from a particle collision, *J. Fluid Mech.* **375**, 345-361 (1998).

Patent issued.

L. C. Nitsche and Y. Liu, Self-assembled toroidal-spiral particles and manufacture and uses thereof, *US Patent 8,852,645*, Issued October 7, 2014.

Grants #5-17 from external funding agencies.

(17) L. C. Nitsche, Co-PI: "NSF INCLUDES: A Community Centered Approach to Improving STEM Pathways for Underrepresented Students." NSF-SES 1649298. Period: 10/01/2016 – 9/30/2018. Budget: \$299,972. (Joint with PI: K. Lawless and co-PIs: J. Abiade, A. Alfonso and D. Wink.)

(16) L. C. Nitsche, Co-PI, "An Integrated Program for Recruitment, Retention, and Graduation of Academically Talented Low Income Engineering Students." NSF-DUE 1644182. Period: 07/01/2017 – 06-30/2022. Budget: \$975,050. (Joint grant with PI: H. Darabi and other Co-PIs: R. Revelo Alonso, J. Abiade and P. C. Nelson.)

(15) L. C. Nitsche, Co-PI, "Toroidal-spiral particles (TSPs) for co-delivery of multiple compounds of different sizes." NSF-DMR 1404884. Period: 08/01/2014 – 07/31/2017. Budget: \$390,000. (Joint grant with PI: Y. Liu and other Co-PI: R. Gemainhart.)

(14) L. C. Nitsche, PI, "Midwest Thermodynamics and Statistical Mechanics (MTSM) Conference." NSF-CBET . Period: 05/01/2014 – 04/30/2015. Budget: \$10,000. (Co-PI: S. Murad.)

(13) L. C. Nitsche, PI, "Collaborative Research: GOALI: Multiscale Theory and Computer Simulation of Skin Absorption Phenomena." NSF-CBET 1335869. Period: September 1, 2013 - August 31, 2016. Budget: \$101,229. (Partner investigators and institutions: J. M. Nitsche, State University of New York at Buffalo; G. B. Kasting, University of Cincinnati.)

(12) L. C. Nitsche, PI, "Scholarship Program for Women in Chemical Engineering." NSF-DUE 1060198. Period: September 1, 2012 – August 31, 2017. Budget: \$599,766. (Joint grant with Co-PIs: S. Murad, L. E. Wedgewood, P. C. Nelson and G. A. Smith.)

(11) L. C. Nitsche, Co-PI, "EAGER: Preliminary Study on Novel self-assembled Toroidal-Spiral MicroParticles (TSMPs) for sustained release of therapeutic proteins and peptides: theory and experiments." NSF-CBET 1039531. Period: September 1, 2010 – August 31, 2012. Budget: \$65,688. (Joint grant with PI: Y. Liu.)

(10) L. C. Nitsche, Co-PI, "GILEE: Establishing a Graduate Interdisciplinary Liberal Engineering Ethics Curriculum." NSF-DBI 0832738. Period: August 15, 2008 – August 14, 2011. Budget: \$49,999. (Joint grant with PI: S. Murad and other Co-PI: L. E. Wedgewood.)

(9) L. C. Nitsche, PI, "Aspen Modeling of Thermochemical Cycles." Argonne National Laboratory Subcontract 9J-30282, Period: 05/03/2010 – 9/30/2011. Budget: \$33,209. (Joint grant with Co-PI: L. E. Wedgewood.)

(8) L. C. Nitsche, PI, "Evaluation of Three Related Forms of a Copper-Chlorine Thermo-Chemical Cycle for Hydrogen Production." Argonne National Laboratory Subcontract continuation. Period: 9/15/2006 – 12/30/2007. Budget: \$55,000. (Joint grant with Co-PI: L. E. Wedgewood.)

(7) L. C. Nitsche, PI, "Evaluation of Three Related Forms of a Copper-Chlorine Thermochemical Cycle for Hydrogen Production." Argonne National Laboratory Subcontract 6F-00251. Period: 05/15/2006 – 09/15/2006. Budget: \$42,000. (Joint grant with Co-PI: L. E. Wedgewood.)

(6) L. C. Nitsche, PI, "Economic analysis of a desalination process using zeolite membranes." Subcontract from New Mexico Institute of Mining and Technology. Period: 1/01/ 2005 – 05/31/2006. Budget: \$30,000.

(5) L. C. Nitsche, USIA Fulbright Senior Scholar Program, 1999-2000, Award #9498: Austria, Research. Budget: ATS 125,000 (approximately \$9,600).

Graduate research students

Prashanth Parthasarathi	PhD	Summer 2008
Javier Rios	MS	Summer 2006
Olga Jedry	MS	Fall 2005
Tejas Shah	MS	Spring 2005 (co-advised with S. Murad)
Weidong Zhang	PhD	Spring 2004

(2.3)



FULBRIGHT COMMISSION
SCHMIDGASSE 14, A-1082 WIEN

SECRETARIAT 313 3973-2685
STUDENT ADVISING 313 3973-2629
INTERNATIONAL 411-313 3973-2685
FAX 408 7765

Prof. Ludwig C. Nitsche
605 West Madison Street, # 1912
Chicago IL 60661-2410
USA

September 1, 1999

Memorandum

TO: All 1999/2000 Fulbright grantees
FROM: Dr. Lonnie Johnson, Executive Secretary
RE: Orientation Program, October 1-5, 1999

Enclosed for your reference is the tentative orientation program. Please note that we will begin at **9.00 AM** at the Amerika Haus, Friedrich Schmidt Platz 2 (nearest U-Bahn station: U - 2: Rathaus).

Please inform us regarding your arrival plans and copy any relevant correspondence to Mr. Günter Fassel, our financial and administrative officer, at gjf@usia.co.at.

Last of all I would like to remind you to bring the originals of any documents you may need in the course of your stay (birth certificates, marriage certificates, if appropriate) with you should you need them in the course of your stay.

We look forward to seeing you soon!



(TENTATIVE)
ORIENTATION PROGRAM
FOR AMERICAN FULBRIGHT GRANTEES 1999-2000
Vienna, October 1 – October 5, 1999

All events will take place at the Amerika Haus,
Friedrich Schmidt Platz 2, 1010 Vienna
(U-Bahn Station "Rathaus"- U 2)
unless otherwise noted

Friday, October 1, 1999

- 09.00 **Welcome and Introductions**
Dr. LW Koengeter, Chairperson of the Austrian Fulbright Commission
1999 and Public Affairs Officer, United States Embassy, Vienna
Dr. Lonnie R. Johnson, Executive Director
- 09:30 **Lecture: "Austria in Transition"**
Prof. Anton Pelinka, Institute of Political Science, University of Innsbruck;
Director of the Institute for Conflict Research, Vienna; Fulbright Scholar
(Harvard, '89/90), Fulbright Commission Board Member
- 11.00 Coffee Break
- 11:30 **Program overview, distribution of orientation material and
maintenance checks**
Dr. Lonnie Johnson, Mr. Günter Fassel, Finance and Administration
- Lunch Break (Grantees will have an opportunity to cash their first maintenance checks.
Please note, however, that banks are closed in Austria from 12.30-13.30)
- 14:30 **"Living in Austria: The Challenges of Everyday Life "**
An open session on pragmatic concerns (banking, finances, transportation,
communications, libraries, research facilities, university studies, shopping,
laws and regulations, etc.) with Dr. Lonnie Johnson, Mr. Günter Fassel,
Mag. Karin Riegler and "veteran" Fulbright grantees from 1998/99.

Saturday, October 2, 1999

Bus Trip to Melk Monastery, Wachau-Danube-Valley, Dörenstein

Note: Students whose grants are combined with teaching assistantships should report to
their *Stammschulen* at 8.00 a.m.

- 11:00 **Departure: Amerika Haus, Friedrich Schmidt Platz 2**
Route: Vienna - Melk - Wachau Valley - Durnstein
Guided tour of the Melk Monastery
Visit to the Wachau Vinter's Association (*Winzerverband*)
Visit to the village of Dürnstein
Heurigen hosted by Dr. Erwin Pröll, Governor of Lower
Austria at Heurigen Mittelbach, Durnstein
- 8.30 p.m **Departure for Vienna**

Sunday, October 3, 1999

- AM Free
- 12.30 **Walking tour of the Inner City of Vienna including a tour of the Imperial**
Apartments in the Hofburg Palace

Monday, October 4, 1999

- 09.30 **"The Morning After: What has Changed? What is the Same!"**
A look at the Austrian political system (and elections of October 3) by Prof.
Peter Gerlich, Institute of Political Science, University of Vienna (Fulbright
student at Columbia, '60-61 and Fulbright Professor at Stanford, '80-81).
- 11.00 **Coffee Break**
- 11.30 **"Austrian Higher Education and Research in the 20th Century: Empire,**
Exile, Modernization"
Prof. Friedrich Stadler, Institute Vienna Circle; Center for Interdisciplinary
Studies, University of Vienna; Fulbright Scholar in the US, '98/99
- 2:00 p.m. **"Transatlancisim: Austria, the United States, and the European Union "**
Ges. Dr. Hans Winkler, Head of the Americas Department, designated
Director of the Office of International Law, Austrian Ministry of Foreign
Affairs
- 15.30 **Coffee Break**
- 16.00 **Wrap-up session**
- 17.00 **Reception**

Tuesday, October 5, 1999

- 10.00 **Tour of the Austrian National Library for PhD candidates and scholars**

Friday, October 8, 1999

- 18.00 **Reception for Austrian and American Fulbright Program Participants**
hosted by Her Excellency US Ambassador Kathryn Walt Hall at the
Ambassador's residence



FULBRIGHT COMMISSION
SCHMIDGASSE 14, A-1082 WIEN

SECRETARIAT: 313.3973-2685
STUDENT ADVISING: 313.3973-2629
INTERNATIONAL: 431-313.3973-2685

FAX: 408 7765

Prof. Ludwig C. Nitsche
605 West Madison Street # 1912
Chicago, IL 60661-2410
U S A

May 6, 1999

Dear Professor Nitsche,

Thank you for the acceptance of your Fulbright grant. On behalf of the Austrian-American Educational Commission, I wish to extend the Commission's best wishes for a profitable stay in Austria. We hope that you will enjoy working with us to ensure the success of the Fulbright Program. I will notify your Austrian host and host institution that you have accepted your Fulbright award and encourage you to stay in touch with them directly to prepare your stay. They are a valuable onsite resource, and "institutional hospitality" is an important variable in determining the quality of your stay.

This is the first of two mailings you will receive with background information.

1. **Orientation in Vienna:** The orientation program for all grantees will be held in Vienna from October 1-4, 1999.
2. **Residency permits for Austria:** New and rigorous laws regarding the status of non-European Union citizens who wish to reside in Austria for longer periods of time as students (over six months) or are engaged in some type of work (teaching assistants, lecturers, and research scholars) have gone into effect. You must apply for a residency permit at the appropriate Austrian consular office well before departing from the U.S., and they will issue it to you.

A list of Austrian consular offices is enclosed, and I would suggest that you call to inquire about the application procedures and forms. You will need to document that you have an "income" in Austria (your grant) and health insurance. A copy of the grant award papers issued to you by the Commission should suffice for those purposes. If there are any problems, please do not hesitate to contact me. (They may – or may not – for example, ask you to provide documentation that you do not have a criminal record.)

Please note that there is a special visa category for scholars and researchers, who are spending less than 6 months in Austria. This is the type of residency permit you should apply for.

3. **Photo for the Commission:** All grantees are requested to transmit to the Commission at their early convenience one passport size photo. (Please note: you also will need others once you are in Austria for street car passes, etc., so bring a few with you.)
4. **Travel Information:** Please consult the enclosed information sheet.
5. **Housing Information:** Please consult the enclosed information sheet.

Prof. Ludwig C. Nitsche
May 6, 1999
page 2

6. Further Information: "Useful Hints for American Fulbright Grantees to Austria" will be forwarded to your home address in June.

Please feel free to call on us whenever need arises or contact the Commission's administrative and financial officer Günter Fassel (gfj@usia.co.at) or me (lrj@usia.co.at) by e-mail. Please note, however, that I will be traveling in the US on Commission business from mid-May until early June.

Sincerely yours,

A handwritten signature in blue ink, appearing to read "Lonnie Johnson".

Dr. Lonnie Johnson
Executive Secretary

enc: 3

FULBRIGHT COMMISSION
SCHMIDGASSE 14, A-1082 WIEN



SECRETARIAT: 313 3973-2685
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Fulbright Program Austrian and US Participants 1999/2000

1. **Austrian Fulbright Researchers/Scholars in the US (9)**
2. **US Fulbright Guest Professors (GP) and Researchers (R) in Austria (8)**
3. **Austrian Fulbright Students in the US (19)**
4. **US Fulbright Students at Austrian Universities (19)**
5. **Austrian Fulbright Foreign Language Teaching Assistants at US Colleges and Universities (10)**
6. **US Foreign Language Teaching Assistants at Austrian Secondary Schools (program coordinated in collaboration with the Austrian Ministry of Education and Cultural Affairs) (94)**

Austrian Fulbright Researchers/Scholars in the US -1999/2000 (2 to 4 months): (9)

Univ. Asst. Dr. Alexander Beer
Department of English/Business English, WU Wien
American Business English on the Internet
Georgetown University

Univ. Asst. Mag.Dr. Franz Gramlinger
Department of Vocational and Business Education – Institute of Pedagogics and Psychology,
Universität Linz
Teaching and learning in information and communication networks: asynchronous,
interdisciplinary and intercultural
City University of New York

ao. Univ Prof. Mag.Dr. Walter Hölbling
Institute of American Studies, KFU Graz
The Collector, the Politician, and the Humanist: Three Austrian Refugee Publishers in the
USA
SUNY Albany, Columbia

DDI Dr. Robert Jandl
Austrian Forest Research Center, BOKU
Relationship between recent changes of growth rates, nutrition, and soil chemistry of Norway
spruce stands
Colorado State University

Mag. Franz Kawrza
Universität für Musik und darstellende Kunst Graz
Resident artist – master classes
Ball State University, IN

Univ. Asst. DI Dr. Rainer Kolator
Department of Construction Management and Economics, TU Wien
Construction works in public areas: social costs caused by traffic disruption
Columbia

Univ. Asst. Mag. Dr. Thomas Kostal
Department of Public Finance, WU Wien
A comparative approach to financing universities in Austria and the United States
University of Kentucky

Mag. Dr. Ingeborg Pauluzzi
Institute of Plant Physiology, Universität Wien
Plasmolysis – Reinvestigation of an old story by application of advanced techniques in plant
cell biology
Universtiy of Massaschusetts, Amherst

Dr. Selman Uranüs
Department of Surgical Research, KFU Graz
Installation of a central trauma registry in Austria
University of Pennsylvania Hospital, HUP, Philadelphia

US Fulbright Guest Professors (GP) and Researchers (R) - 1999/2000 (9)

Prof. Jay Martin Anderson (GP)
Franklin & Marshall College, Lancaster
Algorithms for Computer Cartography
Vienna University of Technology
SS 2000

Prof. Ralph W. Fasold (GP)
Georgetown University, Washington, D.C.
Syntax/Discourse Interaction and Sociolinguistics
University of Graz
SS 2000

Prof. Dr. Gregory L. Florant (R)
Colorado State University, Ft. Collins
Essential Fatty Acids and Hibernation Behavior
Vienna University of Veterinary Medicine
SS 2000

Prof. Harvey A. Goldstein (GP)
University of North Carolina at Chapel Hill
Comparative Regional Development Planning
University of Economics and Business Administration
SS 2000

Prof. Charles W. Ingrao (R)
Purdue University, West Lafayette
Fulbright/IFK Visiting Fellow in Cultural Studies
The Decline and Fall of the Multinational Empire: Central Europe, 1815-2000
Internationales Forschungszentrum Kulturwissenschaften
SS 2000

Prof. Ludwig C. Nitsche (R)
University of Illinois at Chicago
Dynamics of the Interface between Clear Fluid and a Particulate Suspension: Fundamental and Applied Fluid Mechanics
Technical University Graz
WS 1999

Dr. Cecilia Porter (R)
Independent Scholar
Critical Assessments of Music by Women Composers in Vienna, 1910-1960
University of Vienna
SS 2000

Prof. Edward Shorter (GP/R)
Fulbright/Freud Society Visiting Scholar in Psychoanalysis
University of Toronto
Sigmund Freud Society (research) / University of Vienna (lecturing)
SS 2000

Austrian Fulbright Students in the US - 1999-2000 (19)

Mag. Wolfgang Bergthaler
Universität Graz
LLM
Georgetown University, Washington DC

Mag. Jan Bohanes
Universität Wien
M International Relations
Tufts University (Fletcher School), MA

Mag. Beate Gerstbrein
Universität Graz
PhD Molecular Biology
Rutgers University, NJ

Mag. Christian Hederer
Universität Wien
PhD Economics/Political Economy
University of California - Berkeley

Mag. Gabriele Heindl
Akademie der bildenden Künste
M Architecture and Urban Design
Princeton University, NJ

DI Bernhard Klingenberg
TU Graz
PhD Statistics
University of Florida at Gainesville

Mag. Karin Lukas
Universität Wien
LLM
American University, Washington D.C.

Mag. Christiane Rainer
Universität Wien
M Museum Studies
George Washington University, Washington DC

Dr. Natalie F. Reiner
Universität Wien/WU Wien
LLM
New York University

Mag. Alexander K. Rozmán
Universität Wien
M International Relations
Georgetown University, Washington DC

Mag. Sonja Schmid
Universität Wien
PhD Science, Technology and Society



Fiscal Impact Statement

TO: The Board of Trustees

FROM: Managing Director of Finance *David A. Franklin*

DATE: November 19, 2019

SUBJECT: Tenure Approval for Dr. Ludwig Nitsche

Conclusion

It is concluded that there is no fiscal impact associated with the granting of tenure to Dr. Ludwig Nitsche in the School of Engineering & Applied Sciences (SEAS) of the University of the District of Columbia (UDC).

The proposed resolution is for the approval of tenure for Dr. Nitsche. It has been recommended in the Board Resolution that Dr. Nitsche, who joined as Associate Dean of the School of Engineering and Professor of Mechanical Engineering in August 2019 be offered tenure at the rank of Professor.

Background

Dr. Nitsche is recognized for his research awards such as the NSF Research Initiation Award; ACS Petroleum Research Fund Type G grant; 1994 NSF Young Investigator (NYI) Award; grants and contracts from the National Science Foundation and the Argonne National Laboratory; a 1999 Fulbright scholar award; and a U.S. Patent on manufacturing drug-delivery particles via drop fluid mechanics. Dr. Nitsche's service is recognized by his contribution to engineering accreditation through ABET by the web-based student assessment method and was adopted by engineering college-wide at the University of Illinois Chicago

The recommendation of tenure for Dr. Ludwig Nitsche has been affirmed by the Dean, CAO, and President. The President has forwarded the recommendation for tenure to the Board of Trustees.

Financial Impact

This request is approved based upon the information provided. There are no anticipated risks at this time.