

# TRAVELS NOW AND THEN

© Christopher Earls Brennan

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## China 2018



上海交通大学  
SHANGHAI JIAO TONG UNIVERSITY

### INVITATION LETTER

Dr. Hua Liu, Distinguished Professor, Director  
Key Laboratory of Hydrodynamics (Ministry of Education)  
School of Naval Architecture, Ocean and Civil Eng.  
Shanghai Jiao Tong University  
800 Dongchuan Road, Shanghai 200240, China  
Phone: +86-21-34204295 +86-13701764391 Email: [hliu@sjtu.edu.cn](mailto:hliu@sjtu.edu.cn)

August 19, 2018

Dr. Christopher Earls Brennen  
Hayman Professor of Mechanical Engineering, Emeritus  
Mail Code 104-44, Department of Mechanical Engineering  
California Institute of Technology  
Pasadena, California 91125, USA  
Phone: +1-626-395-4117 Email: [brennen@caltech.edu](mailto:brennen@caltech.edu)

Dear Professor Brennen:

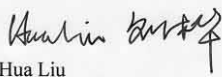
On behalf of the Key Laboratory of Hydrodynamics (MOE) and the School of Naval Architecture, Ocean and Civil Engineering, Shanghai Jiao Tong University, I would like to invite you to visit our school. The period of your visit to SJTU is from October 20 to October 27, 2018.

During your visit, I'd like to invite you to give an invited lecture at the Cavitation Forum to be held in on October 25 at SJTU and visit the facilities for hydrodynamics research at SJTU. I am sure that your lecture about the perspective on the cavitation research challenges will be a definitely important guideline for our further work. Before the Cavitation Forum, we will make an organized program for you to visit the China Ship Scientific Research Center in Wuxi and the related research groups at other institutions in China.

I believe that it will also be a golden opportunity for us to exchange information about education and research in fluid mechanics. I'd like to confirm that our school will cover your round trip tickets to and from China-USA and local accommodation in China.

I look forward to seeing you in Shanghai.

Best regards,

  
Hua Liu

002089

上海东川路800号

800Dongchuan Road ,Shanghai 200240.China

<http://www.sjtu.edu.cn>



上海交通大学  
SHANGHAI JIAO TONG UNIVERSITY

## INVITATION LETTER

August 19, 2018

Consulate General of the People's Republic of China  
Visa Section  
USA

Re: Chinese Business Visa for:  
Name: Christopher Earls Brennen  
Date of Birth: December 3, 1941  
Gender: Male  
Passport Number: 499042827  
Nationality: USA  
Job Title: Professor Emeritus, California Institute of Technology, USA  
Date of Arrival & Departure: arrival on 23th October 2018 and departure on the 28<sup>th</sup> October 2018  
Phone: +1-626-395-4117 Email: [brennen@caltech.edu](mailto:brennen@caltech.edu)

Dear Sir/Madam:

Please be informed that Professor Christopher Earls Brennen from California Institute of Technology is invited for a visit to Shanghai Jiao Tong University in Shanghai, China.

Shanghai Jiao Tong University and California Institute of Technology have established good relationship in education and research in engineering science. The purpose of his visit to attend the Cavitation Forum to be hold on October 25 at SJTU and to give an invited keynote talk for the conference. During his visit in Shanghai, we will discuss the possibility of further collaboration in education and research in fluid mechanics between Caltech and SJTU and arrange a technical tour to the research facilities in hydrodynamics research.

During his stay, I'd like to confirm that SJTU will cover his round trip tickets to and from China-USA and local accommodation in China.

If you need any information, please feel free to contact with me. I can be reached at +86-13701764391 or +86-21-34204295.

We would appreciate if you could kindly grant him business visa so that he can make the trip. Thank you for your kind consideration.

Yours sincerely,

Hua Liu, Distinguished Professor  
Director, Key Laboratory of Hydrodynamics (Ministry of Education)  
School of Naval Architecture, Ocean and Civil Eng.  
Shanghai Jiao Tong University  
Phone: +86-21-34204295 +86-13701764391 Email: [hliu@sjtu.edu.cn](mailto:hliu@sjtu.edu.cn)

上海东川路800号

800Dongchuan Road, Shanghai 200240, China

<http://www.sjtu.edu.cn>

002089

141399

中华人民共和国签证申请表  
Visa Application Form of the People's Republic of China  
(For the Mainland of China only)

申请人必须如实、完整、清楚地填写本表格。请逐项在空白处用中文或英文大写字母打印填写，或在□内打√选择。如有关项目不适用，请填写“无”。The applicant should fill in this form truthfully, completely and clearly. Please type the answer in capital English letters in the space provided or tick (√) the relevant box to select. If some of the items do not apply, please type N/A or None.

一、个人信息 Part 1: Personal Information

1.1 英文姓名 Full English name as in passport	姓 Last name	Brennen	粘贴一张近期正面免冠、浅色背景 的彩色护照照片。 照片/Photo Affix one recent color passport photo (full face, front view, bareheaded and against a plain light colored background).
	中间名 Middle name	Earls	
	名 First name	Christopher	
1.2 中文姓名 Name in Chinese	1.3 别名或曾用名 Other name(s)	None	
1.4 性别 Sex	<input checked="" type="checkbox"/> 男 M <input type="checkbox"/> 女 F	1.5 出生日期 DOB(yyyy-mm-dd)	1941-12-03
1.6 现有国籍 Current nationality(ies)	USA	1.7 曾有国籍 Former nationality(ies)	UK
1.8 出生地点(市、省/州、国) Place of birth(city, province/state, country)	BELFAST, NORTHERN IRELAND, UK		
1.9 身份证/公民证号码 Local ID/ Citizenship number	A0587158 (California)		
1.10 护照/旅行证件种类 Passport/Travel document type	<input type="checkbox"/> 外交 Diplomatic <input type="checkbox"/> 公务、官员 Service or Official <input checked="" type="checkbox"/> 普通 Ordinary <input type="checkbox"/> 其他证件(请说明) Other (Please specify):		
1.11 护照号码 Passport number	499042827	1.12 签发日期 Date of issue(yyyy-mm-dd)	2012-09-24
1.13 签发地点 Place of issue	DC, USA	1.14 失效日期 Date of expiry(yyyy-mm-dd)	2022-09-23
1.15 当前职业 (可选多项) Current occupation(s)	<div><input type="checkbox"/> 商人 Businessperson    <input type="checkbox"/> 前/现任议员 Former/incumbent member of parliament <input type="checkbox"/> 公司职员 Company employee    职位 Position None <input type="checkbox"/> 演艺人员 Entertainer    <input type="checkbox"/> 前/现任政府官员 Former/incumbent government official    职位 Position None <input type="checkbox"/> 工人/农民 Industrial/Agricultural worker    <input type="checkbox"/> 军人 Military personnel    职位 Position None <input type="checkbox"/> 学生 Student    <input type="checkbox"/> 非政府组织人员 NGO staff <input type="checkbox"/> 乘务人员 Crew member    <input type="checkbox"/> 宗教人士 Religious personnel <input type="checkbox"/> 自雇 Self-employed    <input type="checkbox"/> 新闻从业人员 Staff of media <input type="checkbox"/> 无业 Unemployed <input checked="" type="checkbox"/> 退休 Retired  <input type="checkbox"/> 其他(请说明) Other (Please specify): None</div>		
1.16 受教育程度 Education	<input checked="" type="checkbox"/> 研究生 Postgraduate <input type="checkbox"/> 大学 College <input type="checkbox"/> 其他(请说明) Other (Please specify):		
1.17 工作单位/学校 Employer/School	名称 Name	California Institute of Technology (previous) 联系电话 Phone number None	
	地址 Address	1201 California Boulevard Pasadena, CA 邮政编码 Zip Code 91125	

<b>1.18 家庭住址</b> <b>Home address</b>		2340 Bucktail Court Mount Pleasant, SC		<b>1.19 邮政编码</b> <b>Zip Code</b>		29466		
<b>1.20 电话/手机</b> <b>Home/mobile phone number</b>		6266881381		<b>1.21 电子邮箱</b> <b>E-mail address</b>		brennen@caltech.edu		
<b>1.22 婚姻状况</b> <b>Marital status</b> <input checked="" type="checkbox"/> 已婚 <b>Married</b> <input type="checkbox"/> 单身 <b>Single</b> <input type="checkbox"/> 其他 <b>Other(Please specify):</b> N/A								
<b>1.23 主要家庭成员</b> (配偶、子女、父母等,可另纸) <b>Major family members (spouse, children, parents, et c., may type on separate paper)</b>	姓名 <b>Name</b>		国籍 <b>Nationality</b>		职业 <b>Occupation</b>		关系 <b>Relationship</b>	
	Barbara Brennan		USA		Retired		Wife	
<b>1.24 紧急联络人信息</b> <b>Emergency Contact</b>	姓名 <b>Name</b> Barbara Brennan			手机 <b>Mobile phone number</b> 2032157642				
	与申请人的关系 <b>Relationship with the applicant</b> Wife							
<b>1.25 申请人申请签证时所在的国家或地区</b> <b>Country or territory where the applicant is located when applying for this visa</b>				USA				

二、旅行信息 **Part 2: Travel Information**

<b>2.1 申请入境事由</b> <b>Major purpose of your visit</b>	<input type="checkbox"/> 官方访问 <b>Official Visit</b> <input type="checkbox"/> 旅游 <b>Tourism</b> <input checked="" type="checkbox"/> 交流、考察、访问 <b>Non-business visit</b> <input type="checkbox"/> 商业贸易 <b>Business &amp; Trade</b> <input type="checkbox"/> 人才引进 <b>As introduced talent</b> <input type="checkbox"/> 执行乘务 <b>As crew member</b> <input type="checkbox"/> 过境 <b>Transit</b>		<input type="checkbox"/> 常驻外交、领事、国际组织人员 <b>As resident diplomat, consul or staff of international organization</b> <input type="checkbox"/> 永久居留 <b>As permanent resident</b> <input type="checkbox"/> 工作 <b>Work</b> <input type="checkbox"/> 寄养 <b>As child in foster care</b>	
	<input type="checkbox"/> 短期探望中国公民或者具有中国永久居留资格的外国人 <b>Short-term visit to Chinese citizen or foreigner with Chinese permanent residence status</b>		<input type="checkbox"/> 与中国公民或者具有中国永久居留资格的外国人家庭团聚居留超过 180 日 <b>Family reunion for over 180 days with Chinese citizen or foreigner with Chinese permanent residence status</b>	
	<input type="checkbox"/> 短期探望因工作、学习等事由在中国停留居留的外国人 <b>Short-term visit to foreigner residing in China due to work, study or other reasons</b>		<input type="checkbox"/> 长期探望因工作、学习等事由在中国居留的外国人 <b>As accompanying family member of foreigner residing in China due to work, study or other reasons</b>	
	<input type="checkbox"/> 短期学习 <b>Short-term study for less than 180 days</b>		<input type="checkbox"/> 长期学习 <b>Long-term study for over 180 days</b>	
	<input type="checkbox"/> 短期采访报道 <b>As journalist for temporary news coverage</b>		<input type="checkbox"/> 外国常驻中国新闻机构记者 <b>As resident journalist</b>	
	<input type="checkbox"/> 其他(请说明) <b>Other (Please specify):</b>			
<b>2.2 计划入境次数</b> <b>Intended number of entries</b>	<input checked="" type="checkbox"/> 一次(自签发之日起 3 个月有效) <b>One entry valid for 3 months from the date of issue</b> <input type="checkbox"/> 二次(自签发之日起 3-6 个月有效) <b>Two entries valid for 3 to 6 months from the date of issue</b> <input type="checkbox"/> 半年多次(自签发之日起 6 个月有效) <b>Multiple entries valid for 6 months from the date of issue</b> <input type="checkbox"/> 一年多次(自签发之日起 1 年有效) <b>Multiple entries valid for 1 year from the date of issue</b> <input type="checkbox"/> 其他(请说明) <b>Other (Please specify):</b>			
<b>2.3 是否申请加急服务</b> <b>Are you applying for express service?</b>		<input checked="" type="checkbox"/> 是 <b>Yes</b> <input type="checkbox"/> 否 <b>No</b>		
注: 加急服务须经领事官员批准, 将加收费用。 <b>Note: Express service needs approval of consular officials, and extra fees may apply.</b>				
<b>2.4 本次行程预计首次抵达中国的日期</b> <b>Expected date of your first entry into China on this trip (yyyy-mm-dd)</b>		2018-10-22		


<b>2.5 预计行程中单次在华停留的最长天数 Longest intended stay in China among all entries</b>		<b>7</b>	<b>Days</b>
<b>2.6 在中国境内行程（按时间顺序，可附另纸填写） Itinerary in China (in time sequence, may type on separate paper)</b>	<b>日期 Date</b>	<b>详细地址 Detailed address</b>	
	2018-10-22 to 2018-10-28	Shanghai Jiao Tong University, 800 Dongchuan Road, Shanghai, 200240	
<b>2.7 谁将承担在中国期间的费用？ Who will pay for your travel and expenses during your stay in China?</b>		Shanghai Jiao Tong University	
<b>2.8 中国境内邀请单位或个人信息 Information of inviter in China</b>	<b>姓名或名称 Name</b>	Professor Hua Liu	
	<b>地址 Address</b>	Shanghai Jiao Tong University, 800 Dongchuan Road, Shanghai, 200240	
	<b>联系电话 Phone number</b>	+86-21-34204295	
	<b>与申请人关系 Relationship with the applicant</b>	Colleague	
<b>2.9 是否曾经获得过中国签证？如有，请说明最近一次获得中国签证的时间和地点。 Have you ever been granted a Chinese visa? If applicable, please specify the date and place of the last time you were granted the visa.</b>		2015-07-15, Los Angeles, CA, USA	
<b>2.10 过去 12 个月中访问的其他国家或地区 Other countries or territories you visited in the last 12 months</b>		UK	

### 三、其他事项 Part 3: Other Information

<b>3.1 是否曾在中国超过签证或居留许可允许的期限停留？ Have you ever overstayed your visa or residence permit in China?</b>	<input type="checkbox"/> 是 Yes <input checked="" type="checkbox"/> 否 No
<b>3.2 是否曾经被拒绝签发中国签证，或被拒绝进入中国？ Have you ever been refused a visa for China, or been refused entry into China?</b>	<input type="checkbox"/> 是 Yes <input checked="" type="checkbox"/> 否 No
<b>3.3 是否在中国或其他国家有犯罪记录？ Do you have any criminal record in China or any other country?</b>	<input type="checkbox"/> 是 Yes <input checked="" type="checkbox"/> 否 No
<b>3.4 是否具有以下任一种情形 Are you experiencing any of the following conditions?</b> ①严重精神障碍 Serious mental disorder ②传染性肺结核病 Infectious pulmonary tuberculosis ③可能危害公共卫生的其他传染病 Other infectious disease of public health hazards	<input type="checkbox"/> 是 Yes <input checked="" type="checkbox"/> 否 No
<b>3.5 近 30 日内是否前往过流行性疾病传染的国家或地区？ Did you visit countries or territories affected by infectious diseases in the last 30 days?</b>	<input type="checkbox"/> 是 Yes <input checked="" type="checkbox"/> 否 No
<b>3.6 如果对 3.1 到 3.5 的任何一个问题选择“是”，请在下面详细说明。 If you select Yes to any questions from 3.1 to 3.5, please give details below. N/A</b>	

<p>3.7 如果有本表未涉及而需专门陈述的其他与签证申请相关的事项, 请在此或另纸说明。  <b>If you have more information about your visa application other than the above to declare, please give details below or type on a separate paper.</b></p> <p>None</p>			
<p>3.8 如申请人护照中的偕行人与申请人一同旅行, 请将偕行人照片粘贴在下面并填写偕行人信息。<b>If someone else travels and shares the same passport with the applicant, please affix their photos and give their information below.</b></p>			
偕行人信息 <i>Information</i>	偕行人 1 <b>Person 1</b>  粘贴照片于此 <i>Affix Photo here</i>	偕行人 2 <b>Person 2</b>  粘贴照片于此 <i>Affix Photo here</i>	偕行人 3 <b>Person 3</b>  粘贴照片于此 <i>Affix Photo here</i>
姓名 <b>Full name</b>	N/A		
性别 <b>Sex</b>			
生日 <b>DOB(yyyy-mm-dd)</b>			

#### 四、声明及签名 Part 4: Declaration & Signature

<p>4.1 我声明, 我已阅读并理解此表所有内容要求, 并愿就所填报信息和申请材料的真实性承担一切法律后果。  <b>I hereby declare that I have read and understood all the questions in this application and shall bear all the legal consequences for the authenticity of the information and materials I provided.</b></p> <p>4.2 我理解, 能否获得签证、获得何种签证、入境次数以及有效期、停留期等将由领事官员决定, 任何不实、误导或填写不完整均可能导致签证申请被拒绝或被拒绝进入中国。  <b>I understand that whether to issue a visa, type of visa, number of entries, validity and duration of each stay will be determined by consular official, and that any false, misleading or incomplete statement may result in the refusal of a visa for or denial of entry into China.</b></p> <p>4.3 我理解, 根据中国法律, 申请人即使持有中国签证仍有可能被拒绝入境。  <b>I understand that, according to Chinese law, applicant may be refused entry into China even if a visa is granted.</b></p>	
<p> 申请人签名  <b>Applicant's signature:</b> .....</p>	<p>日期  <b>Date (yyyy-mm-dd):</b> .....</p>
<p>注: 未满 18 周岁的未成年人须由父母或监护人代签。 <b>Note: The parent or guardian shall sign on behalf of a minor under 18 years of age.</b></p>	

#### 五、他人代填申请表时填写以下内容 Part 5: If the application form is completed by another person on the applicant's behalf, please fill out the information of the one who completes the form

5.1 姓名 <b>Name</b>		5.2 与申请人关系 <b>Relationship with the applicant</b>	
5.3 地址 <b>Address</b>		5.4 电话 <b>Phone number</b>	
<p>5.5 声明 <b>Declaration</b>          我声明本人是根据申请人要求而协助填表, 证明申请人理解并确认表中所填写内容准确无误。  <b>I declare that I have assisted in the completion of this form at the request of the applicant and that the applicant understands and agrees that the information provided is true and correct.</b></p> <p>代填人签名/Signature: ..... 日期/Date (yyyy-mm-dd): .....</p>			

## Christopher Earls Brennen 10/18/2018 trip details

Flight to Ontario

American Airlines AA 2740

Confirmation code: UAJUOR

3 hrs 11 min


DFW ———— ✈️ ONT

6:45 PM                      7:56 PM

October 18                      October 18

Dallas                              Ontario

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 [View event](#)

Outlook found new events. Useful | Not useful

Brennen, Christopher E. 

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China18

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## Offers

**AA Record Locator: UAJUOR****Status: Ticketed - Aug 26, 2018**

## Your Itinerary

Carrier	Flight Number	Departing		Arriving		Booking Code	Meals
		City	Date & Time	City	Time		
AMERICAN AIRLINES	2646	CHS Charleston	Oct 18, 2018 03:16 PM	DFW Dallas/ Fort Worth	Oct 18, 2018 05:07 PM	S	Food for purchase
AMERICAN AIRLINES	2740	DFW Dallas/ Fort Worth	Oct 18, 2018 06:45 PM	ONT Ontario	Oct 18, 2018 07:56 PM	S	Food and Beverage for Purchase

## Traveler Information

Passenger	Class	Seat Assignment
CHRISTOPHER EARLS BRENNEN	Economy	20E
CHRISTOPHER EARLS BRENNEN	Economy	20B

Traveling passengers may check in and obtain boarding passes for U.S. domestic electronic tickets within 24 hours of the flight time online at [\[www.aa.com\]](http://www.aa.com)AA.com by using [\[www.aa.com/reservation/flightCheckInViewReservationsAccess.do\]](http://www.aa.com/reservation/flightCheckInViewReservationsAccess.do)[www.aa.com/checkin](http://www.aa.com/checkin) or at a Self-Service Check-In machine at the airport. Check-in options may be found at [www.aa.com/options](http://www.aa.com/options). For information regarding American Airlines checked baggage policies, please visit [\[www.aa.com/baggageinfo\]](http://www.aa.com/baggageinfo)[www.aa.com/baggageinfo](http://www.aa.com/baggageinfo).

Travelers must present a government-issue photo ID with either a boarding pass or a priority verification card at the security screening checkpoint

Please remember flight details are subject to change. In order to check a flight's status, gate, or departure and arrival time, go to [www.aa.com](http://www.aa.com) and enter the flight information in the Gates and Times search area. In order to receive automatic notifications of flight changes, click on the Flight Status Notifications section on the [www.aa.com](http://www.aa.com) homepage and enter the required flight and contact information.

[Privacy Policy](#)

**Tentative Schedule. China, Oct.2018**

<b>Thursday, Oct.18</b>	<b>Fly CHS-ONT. AA. CHS 3.16pm-7.56pm ONT (via DFW)</b>
<b>Friday, Oct.19</b>	<b>Temecula</b>
<b>Saturday, Oct.20</b>	<b>Temecula</b>
<b>Sunday, Oct.21</b>	<b>Temecula</b>
<b>Monday, Oct.22</b>	<b>Fly China Eastern 586, LAX 12.30pm – 5.10pm+1 PVG</b>
<b>Tuesday, Oct.23</b>	<b>-- arriving PVG 5.10pm</b>
<b>Wednesday, Oct.24</b>	<b>Visit to SJTU</b>
<b>Thursday, Oct.25</b>	<b>9am-4pm Conference and Lecture. SJTU</b>
<b>Friday, Oct.26</b>	<b>Travel to Wuxi. Visit CSSRC (Seminar?) Travel Wuxi – SJTU</b>
<b>Saturday, Oct.27</b>	<b>Visit to Chongming/Changxing Islands</b>
<b>Sunday, Oct.28</b>	<b>Fly China Eastern 583, PVG, 1.00pm – 10.05am LAX Stay LA</b>
<b>Monday, Oct.29</b>	<b>Fly LAX-CHS. Delta. LAX 6.45am-4.08pm CHS (via ATL) or Delta. LAX 9.15am-7.13pm CHS (via ATL) or UA LAX 8.44am-6.58pm CHS (via IAD)</b>



## ITINERARY

ORDER ID/IT #: 7076887732

PASSENGER/:iii::g, BRENNEN/CHRISTOPHEREARLS

ISSUE DATE/ti:l SJt!l: 28AUG 2018

TICKET NUMBER/ #: 781-2312116436

GOS PNR/ffiU -: NFEPH3

ISSUING AIRLINE/ti:l M2'.0 : CHINA EASTERN  
AIRLINES

ISSUED AGENT/ti:l { -%l!:MUTAir lines

DATE SM	AIRLINE PNR M:2'.0 ffiU -%	FLIGHT M:'JI-%	DEPARTURE/ E TIME/aj:B] TERMI NAL/M:M	ARRIVAL/ti:lits TIME/aj:B] TERMI NAL/M:M	CLASS M{ .lt	STATUS :xi5
22-OCT-18	NFEPH3	MU586	LAX-Los Angeles 12:30 TERMINAL B OF LOS ANGELES INTERNATIONAL AIRPORT	PVG-Shanghai 17:10 +1 TERMINAL 1 OF PUDONG INTERNATIONAL AIRPORT	Business 0%-M	OK
28-OCT-18	NFEPH3	MU583	PVG-Shanghai 13:00 TERMINAL 1 OF PUDONG INTERNATIONAL AIRPORT	LAX-Los Angeles 10:05 TERMINAL B OF LOS ANGELES INTERNATIONAL AIRPORT	Business 0%-M	OK

FARE/\*Jl : CNY20440.00

TAX/FR : CNY3986.00

TOTAL/, ,i.t Wi: CNY24426.00

• YOU ARE REQUIRED TO GET TO THE INDICATED AIRPORT NO LATER THAN 2 HOURS BEFORE THE SCHEDULED DEPARTURE TIME FOR CHECK-IN AT THE COUNTER. YOU MUST PRESENT THE SAME VALID ID CARD AS WHICH YOU USED TO PURCHASE THE TICKET

• WHEN YOU GO THROUGH SECURITY CHECK, YOU MUST PRESENT YOUR VALID TRAVEL DOCUMENTS AND BOARDING PASS AS WELL AS THE RECEIPT

• FAILED TO USE FLIGHT COUPONS IN SEQUENCE WILL RESULT PENALTY AND ADDITIONAL FARE PAYMENT

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May God continue the unity of our country as the railroad unites the two great oceans of the world.  
inscribed on the Golden Spike, Promontory Point, /869

Visas



登机牌 BOARDING PASS		中国东方航空 CHINA EASTERN		上海航空公司 SHANGHAI AIRLINES		公务舱 BUSINESS CLASS	
航班 FLIGHT	MU 583	承运人 CARRIER	MU	舱位 CLASS	SKY PRIORITY	座位 SEAT	I
日期 DATE	28	航司 AIRLINE	MU583	座位 SEAT	18A	序号 SERIAL NO.	025
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票号 TICKET NO.	021	姓名 NAME	CHRISTOPHER E. BRENNEN	常旅客 FQTV	DL 2104897984		
座位 SEAT	18A	备注 REMARKS	7812312118436/2				
姓名 NAME	BRENNEN/CHRISTOPHER E.						

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NOTICE: GATE WILL BE CLOSED 20 MINUTES BEFORE DEPARTURE

## Schedule for Prof. Brennen's visit in China-20180819

Date	Events	Corresponding persons
October 20 Saturday	CB arrives in Pudong International Airport; Check in at the Academic Center, SJTU campus (referring as AC-SJTU)  Information: breakfast, lunch and dinner at the restaurant of AC-SJTU. All fees Charge to the room number and will be covered by the school.	Mr. Yao Hong and Dr. Hua Liu will meet CB at the exit gate. HL: 13701764391 YH:18818213452
October 21 Sunday	9:00-14:00 Free 14:00-19:00 visit Chongming/Changxing Islands in Shanghai	YH:18818213452 HL: 13701764391
October 22 Monday	10:00-12:00, leave SJTU campus for Wuxi 14:00-17:00, visit CSSRC in Wuxi 17:00, check in the hotel in Wux	HL: 13701764391 YH:18818213452
October 23 Tuesday	10:00-15:00, have one day tour in Wuxi 15:00-18:00, leave Wuxi for Shanghai and 18:00, arrive in Shanghai and check in AC-SJTU	HL: 13701764391 YH:18818213452
October 24 Wednesday	10:00-12:00, discuss with the faculty about fluid mechanics education/visit the facilities on campus 14:00-17:00, prepare the presentation	HL: 13701764391 YH:18818213452
October 25 Thursday	9:00-16:00, attend the Cavitation Forum-2018 at SJTU	HL: 13701764391 YH:18818213452
October 26 Friday	Have a tour in Shanghai/some places around Shanghai for sightseeing	HL: 13701764391 YH:18818213452
October 27 Friday	Leave Shanghai	HL: 13701764391 YH:18818213452

Invited Lecture at the  
Shanghai Jiao Tong University Cavitation Forum,  
Oct. 2018

## **Cavitation Research Review and Challenges for the Future**

by **Christopher Earls Brennen**,  
Richard and Dorothy Hayman Professor, Emeritus,  
California Institute of Technology, Pasadena, California, USA

### **Abstract**

Cavitation was first recognized as a serious technological problem during tests on high speed boats in the 1890s. Since then it has been the subject of much research often requiring the development of advanced new experimental tools such as high-speed water tunnels and high-speed photography and holography. In this lecture we first present a brief summary of the important advances in our knowledge of this complex phenomenon, advances that have not only allowed the development of remedial measures in traditional technical contexts but have also led to brand new technologies in which the phenomenon has been used for remarkable medical purposes. The key to all of this is the recognition that the phenomenon is one of the few ways to focus mechanical energy in enormous intensities to minute targets.

In the second part of the lecture, we will analyze research challenges that lie ahead and that could lead to important progress in our fundamental knowledge of cavitation. This new knowledge and the tools to which it leads have the promise of leading to even more exciting uses of the “Amazing Cavitation Bubble”.