

RECEIVED
JAN 26 1987

ENERGY RESEARCH FOREIGN TRAVEL REQUEST COVER SHEET

*Bill 1/26/87
MJC*

*284-2/SS
275-2/SS*

- 1. TRIP NO.: -----
- 2. HQ APPROVAL REQUIRED: Y
- 3. TRAVELER'S NAME: HERMAN WINICK
- 4. EMPLOYER: STANFORD UNIVERSITY
- 5. EMPLOYER DESIGNATION: L
- 6. DEPARTURE DATE: 5_1_2_1_87
- 7. RETURN DATE: 5_1_9_1_87
- 8. NO. DAYS PERSONAL: 0
- 9. FISCAL YEAR: 87
- 10. DESTINATION(S):

REPOSITORY Stanford Site Office (SSO)
 COLLECTION SSRL 284-2 Human Research
 BOX No. N/A
 FOLDER SSRL-284-2 Human Research

11. TRIP CATEGORY:

IT
 -- CI / -- / -- / --
 -- / -- / -- / --
 -- / -- / -- / --
 -- / -- / -- / --
 -- / -- / -- / --

- 12. CONFERENCE NO.: -----
- 13. B&R CLASSIFICATION: KC 01-03 BES
- 14. ESTIMATED COST TO DOE: \$ 1,500
- 15. ESTIMATED COST TO OTHERS: \$,---
- 16. JUSTIFICATION/PURPOSE: Invited speaker and on the Inter-
Advisory Committee for the
Applications to Digital
Frascati, Italy.

REQUEST FOR APPROVAL OF OFFICIAL FOREIGN TRAVEL

(Previous Editions are Obsolete)

PART A--To be completed by traveler's administrative officer

Budget and Reporting Classification to be charged: KC010201
(See Appendix 1101, Part II)

(The category of a trip, either I, II; or III, is determined by the definitions set forth in Appendix 1501, Part VIII)

TRIP CATEGORY: CI in IT

PART B--To be completed by traveler

1a. NAME OF TRAVELER Herman Winick	c. DATE AND PLACE OF BIRTH June 27, 1932
b. CITIZENSHIP USA	d. PASSPORT NUMBER (if available) 050198873
2a. HOME ADDRESS 853 Tolman Dr. Stanford, CA 94305	d. BUSINESS ADDRESS SSRL P.O. Box 4349, SLAC Bin 69 Stanford, CA 94305
3a. EMPLOYER Stanford University	c. CONTRACT NUMBER DE-AC03-82ER-13000
b. ORGANIZATIONAL UNIT Stanford Synchrotron Radiation Laboratory	d. POSITION TITLE (including profession) Deputy Director & Professor (Research)&Physicist

4. PURPOSE OF TRAVEL--Include all pertinent background information leading to travel and attach copies of invitations and correspondence regarding travel to present papers, give speeches, or to attend conferences or symposia. Also identify by name and organization other DOE and contractor personnel who, to the traveler's knowledge, are going to the same destination at the same time as the traveler. In addition, specify nature and classification of information to be disclosed including titles of papers to be presented; nature of information to be obtained at each of the places to be visited and conferences to be attended and its relation to traveler's work. Travelers are responsible for obtaining clearances for papers or speeches when necessary. If more space is required, attach a separate sheet. NOTE: IF THIS INFORMATION IS CLASSIFIED BE SURE TO CLASSIFY THIS FORM APPROPRIATELY.

Coronary angiography using synchrotron radiation is a very promising and important application of synchrotron radiation. The first and most advanced program in this field is the one underway at SSRL using a high field wiggler magnet as the X-ray source. This program achieved a major milestone with the first use of human subjects in May, 1986. Interest in the field is expanding rapidly and the Frascati group has organized a meeting on the subject. I have been invited to be a member of the International Advisory Committee and to present a lecture at the meeting (see the enclosed letter). I have accepted the invitation to be on the Advisory Committee and have sent detailed comments on the proposed program. I am eager to attend the meeting to learn more about this important application and to share our experience at SSRL, particularly with the use of wiggler magnets as sources for this work.

0021368

Privacy Act Information Statement. Collection of the information is authorized by the Department of Energy Organization Act of 1977, P.L. 95-91. Disclosure of the personal information requested is mandatory to support authorization for official travel to foreign countries, and to obtain a passport

The information furnished will be used by DOE to authorize travel and payment of travel expenses; by the Department of State to issue a passport; and by the General Accounting Office to audit and verify the accuracy and legality of disbursements.

5. PROPOSED ITINERARY (Account for all time from beginning and ending dates of travel. NOTE: IF INFORMATION IS CLASSIFIED, CLASSIFY THIS FORM APPROPRIATELY.)

DATES	LOCATION (Installation, city, country)	INDIVIDUALS TO BE CONTACTED	SUBJECT OF DISCUSSION	(Check one)	
				CLASSI- FIED	UNCLASSI- FIED
May 2 May 3 May 4,5	Leave SF Arrive Frascati Frascati Lab	E. Burattini, G Barbiellini, A. Rindi	Angiography plans, operation & future development of the Frascati SR facility		X
May 6-8	Frascati Lab	Attend Conference on Angiography	SR applications to Digital Angiography		X
May 9	Arrive SF				

6a. TRAVELER'S "Q" OR TOP SECRET ACCESS AUTHORIZATION NUMBER AND DATE:

b. HAS DOE FORM DP-290 PURSUANT TO CHAPTER 2502 BEEN SUBMITTED: (Required only for travel to a Soviet-bloc country by an individual who holds a DOE "Q" or Top Secret Access Authorization)

YES NO

c. IF NOT, WHY NOT?

7. ARTICLE OF AGREEMENT FOR COOPERATION UNDER WHICH DISCUSSIONS WILL FALL (Information on the article may be obtained from local DOE Organization):

8. SIGNATURE OF TRAVELER—By signing, the traveler acknowledges the obligation to file a trip report within 15 days of return to duty station; within 30 days for team trips.

James H. ...
(Signature)

Jan 22, 1987
(Date)

PART C—To be completed by official responsible for travel funds

9a. ESTIMATED COST OF TRAVEL TO DOE

Transportation \$ 1500.00
Per Diem and Miscellaneous \$ Supplied by Conference Organizers
Total \$ 1500.00

b. IF PART OF COST OF TRAVEL IS TO BE PAID OR HAS BEEN REQUESTED FROM SOURCES OTHER THAN DOE, INDICATE SOURCE AND AMOUNT.

c. TRAVEL FUNDS ARE NOW AVAILABLE FOR THIS TRIP.

... ..
(Signature and Title)

23 January 1987
(Date)

PART D—To be completed by Traveler's supervisor

10. ENDORSEMENT AND REMARKS:

A. Burattini
(Signature and title of Supervisor)

1/27/87
(Date)

0021369

PART E--To be completed at DOE Field Organization and/or Laboratory

11. APPROVAL AND/OR REMARKS BY HEAD OF DOE FIELD ORGANIZATION OR DIRECTOR OF LABORATORY:

(Signature)

(Date)

PART F--To be completed at Headquarters

12. CONCURRENCE AND/OR REMARKS OFFICE OF SAFEGUARDS AND SECURITY
(Note compliance with Chapter 2502)

(Signature and Title)

(Date)

13. CONCURRENCE AND/OR REMARKS OFFICE OF INTERNATIONAL SECURITY AFFAIRS

(Signature and Title)

(Date)

14. APPROVAL OR CONCURRENCE/REMARKS BY ASSISTANT SECRETARY FOR INTERNATIONAL AFFAIRS

(Signature and Title)

(Date)

15. CONCURRENCE AND/OR REMARKS--OTHERS

(Signature and Title)

(Date)

16. CONCURRENCE/REMARKS OF DIRECTOR OF DIVISION OR OFFICE

(Signature)

(Date)

17. APPROVAL/REMARKS BY ASSISTANT SECRETARY/DIRECTOR

(Signature)

(Date)



ISTITUTO NAZIONALE DI FISICA NUCLEARE

LABORATORI NAZIONALI DI FRASCATI

Frascati, December 2, 1986
Via E. Fermi, 40

Prof. H. Winick
Stanford Synchrotron Radiation
Laboratory
P.O. Box 4349 Bin 69
Stanford California 94305
U.S.A.

Dear Prof Winick,

we are organizing a Meeting at Frascati (Rome) on "Synchrotron Radiation Applications to Digital Angiography" (SYRDA).

The Meeting should be held from 6 to 8 May 1987 at the National Laboratory of INFN in Frascati, where is in operation a Synchrotron Radiation Facility. The Meeting will be based on a series of invited lectures.

The purpose of the meeting is to bring together the experts in SYRDA and related fields, to compare what has been done up to now at different Laboratories and to draw up lines for future research. This also in view of the formation of a research group in Italy in this field.

We are aware that you have a deep and long experience in Synchrotron Radiation Activities and we invite you to be a member of the International Advisory Committee of the meeting.

As such, we would like to have your opinion about the meeting and comments on the draft program enclosed.

In addition we would like to know if you are interested in presenting a lecture on one of the topics specified in the enclosed preliminary program. Otherwise, we would appreciate your suggestions about persons to propose as invited lecturer for the different topics.

If you accept this invitation, you will be, of course, our guest at the meeting and at all the gatherings of the International Advisory Committee that shall be called.

00213711

We would appreciate an answer from you as soon as possible to send the first bulletin of the meeting in due time.

We hope you will address us a positive answer and remain

Sincerely yours

Emilio Burattini

Guido Barbiellini

Emilio Burattini

Alessandro Rindi

Mailing Address:

Scientific Secretariat of the SYRDA Meeting

c/o Donatella Pierluigi

Laboratori Nazionali di Frascati

C.P. 13

00044 Frascati (Rome)Italy

Enc. : - Draft program of the meeting

284-2/95

13th Annual User's Conference

Stanford Synchrotron Radiation Laboratory

OCT 23-24, 1986

SSRL is supported by the Department of Energy through the Office of Basic Energy Sciences and the National Institutes of Health through the Biotechnology Resource Program in the Division of Research Resources.

SSRL Report No. 86/02

0021373

SYNCHROTRON RADIATION BASED TRANSVENOUS ANGIOGRAPHY IN HUMANS

Edward Rubenstein¹, George S. Brown³, John C. Giacomini¹,
Helen J. Gordon¹, Donald C. Harrison¹, Robert Hofstadter²,
Robert S. Kernoff¹, William Thomlinson⁵, Albert C. Thompson⁴
Herbert D. Zeman²

Department of Medicine, School of Medicine¹,
Hansen Laboratories of Physics & Department of Physics²,
Stanford Synchrotron Radiation Laboratory³,
Stanford University, Stanford, California 94305;

and

Lawrence Berkeley Laboratory, University of California⁴,
Berkeley, California 94720;

and

National Synchrotron Light Source, Brookhaven Laboratory⁵,
Long Island, New York 11973

The availability of a wide (123 mm) beam of hard X-rays in beamline IV-2 at SSRL made possible the recording of iodine k-edge images of the entire central circulation of dogs during November 1985. Thereafter a number of improvements were made in the imaging system. The X-ray fluence was increased by the use of asymmetrically cut monochromator crystals; the vertical scanning speed was increased and the line exposure time decreased by means of an upgraded fast beam switching device; and a new subject support system was installed. These enhancements resulted in striking improvement in the quality of transvenous canine angiograms recorded in May 1986.

These findings led to the use of this imaging system during May 1986 on three human subjects, each of whom was under treatment for coronary artery disease at the Palo Alto Veterans Administration Hospital and the Stanford University Medical Center.

The operating parameters for these studies were: electron beam energy 3.0 GeV; electron beam current 51.5 to 80.4 mA; scanning speed 6 or 12 cm per sec; line exposure time 1.7 or 3.3 msec; interval between exposures 0.4 or 0.8 msec; total time to record one frame (256 lines) 2 sec or 3 sec (including starting and stopping time). The contrast agent (Renografin-76) was injected at rates of 12-15 ml per sec and in volumes of 36 to 50 ml (0.41 to 0.67 ml per kg) by means of a 6.7 French pig-tail catheter, inserted into the internal jugular vein and positioned so that its tip was in the distal superior vena cava or right atrium. The X-ray dose per frame varied from 0.10 to 0.29 rads.

Images were recorded of the left anterior descending coronary artery, the right coronary artery, and of saphenous vein and internal mammary artery grafts. Greater X-ray fluence is needed to provide images of clinical quality. Improvements in the imaging system are now being made to achieve the needed fluence.

EXPERIMENTAL EQUIPMENT AND TECHNIQUE FOR ANGIOGRAPHY USING SYNCHROTRON RADIATION

H.D. Zeman,¹ A.C. Thompson,² W. Thomlinson,³ E. Rubenstein,⁴ J.N. Otis,¹
R. Hofstadter,¹ D.C. Harrison,⁴ H.J. Gordon,⁴ J.C. Giacomini,⁴ and G.S. Brown⁵

¹W.W. Hansen Laboratories of Physics and Department of Physics,
Stanford University

²Lawrence Berkeley Laboratory, University of California, Berkeley

³National Synchrotron Light Source, Brookhaven National Laboratory

⁴Department of Medicine, Stanford University School of Medicine

⁵Stanford Synchrotron Radiation Laboratory, Stanford University

In order to produce clinically interesting coronary angiograms of human subjects during the dedicated running period in May, 1986, it was necessary to implement improvements in the experimental equipment and technique. A new dual-drum X-ray beam chopper was built which would allow the patient to be scanned at 12 cm/sec. It uses two 6.5 in diameter tin plated aluminum drums, each with 10 flat facets and rotating at 1440 RPM, to alternately transmit either the above K-edge X-ray beam or the below K-edge beam. The rotation of the drums is synchronized with the 60 Hz line with a digital phase-locked loop, implemented with a DEC LSI 11/2 computer. The data acquisition is also synchronized with the drum rotation by means of the same phase-locking circuit. The data-acquisition and image pre-processing software were re-written in order to be able to take data at the higher scanning speed, and to be able to display images less than a minute after the end of the scanning procedure.

A new Personnel Protection System (PPS) was built that would allow the safe exposure of a patient in the Synchrotron X-ray beam. The Angiography Hutch was divided into two sections. The front section contained the monochromator, the drum system, the beam monitor, and a fast-acting X-ray beam shutter. The back section contained the patient chair and the power injector for the contrast agent. The x-ray detector was located behind the hutch. The PPS used the fast-acting shutter to maintain safety in the back section of the hutch. For example, opening the door the the back section would cause the shutter to close thus shutting off the beam.

A new image processing algorithm has been developed to allow the visualization of coronary arteries that lie behind the aorta or the left ventricle. This algorithm uses statistical data on the pixel values within a circle surrounding the pixel under study, to adjust a parameter by which the pixel value is multiplied. This technique allows the suppression of structures larger than half the diameter of the circle, making smaller structures clearly visible.

1;1fJ
From: THOMPSON 14-AUG-1986 14:41
To: CERINO
Subj: Angiography

MAIL #26
R E T U R N
AUG 27 1986

At our meeting last week the angiography group decided that we will ~~NOT~~ study human during the winter run.

WEG
WEG

There were several reasons for our decision. They included:

- difficulty in getting garranteed injector time
- we need more x-ray flux and we are not sure our changes to improve flux will work
- we have a lot of work to do which we can use phantoms and perhaps a few dogs to study

284-2/SS

The improvements we plan to study are:

- germanium monochromator crystals (asymmetrically cut)
- a prototype detector with 2 rows of elements (if it works we will take data 2.5 faster and ~~not~~ use the rotating drums)

Press RETURN for more...

MAIL 1/2
1;1fJ

MAIL #26

- tests with a filtered straight through beam
- use of multi-layers ad a monochromator

Our long range plan is that we would have another big human run ~~next~~ summer where we would have a net improvement in x-ray flux per pixel of at least 7 and therefore get images of humans like the excellent dog images we took in May.

T

Cheers Al

0021376