

## Biology

- Biological**
- Cardiovascular/cardiopulmonary**
- 2-DK, Effects of Microgravity on Total Peripheral Vascular Resistance in Humans, Peter Norsk, M.D., Ph.D., DAMEC Research, Copenhagen, Denmark, ESA
- 4-I, Arterial Baroreflex Control of Sinus Node during Exercise in Microgravity Conditions, Fernando Iellamo, M.D, Univ, of Rome Tor Vergata, Rome, Italy, ESA
- 8-D, Influence of Weightlessness on Heart Rate & Blood Pressure Regulation—Responses to Exercise & Valsalva Maneuver, Uwe Hoffmann, Ph.D., Deutsche Sport Hochschule, Cologne, Germany, ESA
- 9-NL, Physiological Parameters that Predict Orthostatic Intolerance After Spaceflight, John Karemaker, Ph.D., Univ, of Amsterdam, Amsterdam, Netherlands, ESA
- 11-DK, Initial Effects of Microgravity on Central Cardiovascular Variables in Humans, Regitze Videbaek, M.D., Univ, Hospital Copenhagen, Copenhagen, Denmark, ESA
- 12-I, Adaptation of Spontaneous Baroreflex Sensitivity to Microgravity, Marco Di Rienzo, Ph.D., Centro di Bioingegneria LaRC, Milano, Italy, ESA
- E386, Arterial Remodeling and Functional Adaptations Induced by Microgravity, Michael Delp, Ph.D., Texas A&M University, College Station, TX, NASA
- Gravito-inertial sensitivity**
- BRIC-14, Development of Gravity Sensitive Plant Cells in Microgravity, Fred D, Sack, Ph.D., OH State Univ., Columbus, OH, NASA
- CEBAS, Fish Otolith Growth and Development of Otolith Asymmetry at Microgravity, H, Rahmann and R, Anken, Univ, of Stuttgart-Hohenheim, Stuttgart, Germany, DLR
- DSO 635 & E118, Spatial Reorientation Following Spaceflight, William Paloski, Ph.D., NASA Johnson Space Center, Houston, TX, NASA
- E127, Anatomical Studies of Central Vestibular Adaptation, Gay R, Holstein, Ph.D., Mt, Sinai Medical Center, New York, NY, NASA
- MFA, Application of Physical & Biological Techniques to study the Gravisensing and Response System of Plants, Karl H, Hasenstein, Ph.D., University of Louisiana - Lafayette, Lafayette, LA, NASA
- Musculo-skeletal**
- 7-S, Cardiopulmonary & Muscular Adaptations During & After Microgravity, Dag Linnarsson, M.D., Ph.D., Karolinska Institute, Stockholm, Sweden, ESA
- BONES, The Role of Bone Cells in the Response of Skeletal Tissues in Microgravity, J.P, Velduijzen, ACTA Vrije University, Amsterdam, The Netherlands, ESA
- CONNECT, Function of the Focal Adhesion of Plaque of Connective Tissue in Microgravity, Ch.-M, Lapiere and A, Kholti, University of Liege, Liege, Belgium, ESA
- E048, Protein Turnover During Spaceflight, Amy Ferrando, Ph.D., Univ, of TX Medical Branch/Shriners Burns Institute, Galveston, TX, NASA
- E381S, Calcium Kinetics During Spaceflight, Scott M, Smith, Ph.D., NASA Johnson Space Center, Houston, TX, NASA
- OBLAST, Comparative Analysis of Osteoblastic (bone-forming) Cells at Microgravity and 1G, C, Alexandre, Paris, Paris, France, ESA
- OCLAST, Microgravity Effects on Osteoclast (bone-removing) Driven Resorption in vitro, A, Zallone, Bari, Bari, Italy, ESA
- OSMIN, Osteoblasts in Space, Dr, L, Vico, Mr, A, Guignandon, LBBTO, St, Etienne, France, ESA
- OSPACE, Osteoclasts in Space, Prof, A, Zallone, Dr, Mori, Univ, of Bari, Bari, Italy, ESA
- OSTEOGENE, Identification of Microgravity-Related Genes in Osteoblastic Cells, R, Bouillon, Leuven, Leuven, Italy, ESA
- [bone gene regulation], Osteoporosis Experiment in Orbit, Dennis R, Sindrey, NPS Allelix, Mississauga, Ont., Canada, CSA
- [hormones and osteoblasts], Osteoporosis Experiment in Orbit, Dr, Leticia G, Rao, St, Michael's Hospital, Toronto, Ont., Canada, CSA
- [sleep & immune effects on bone], Osteoporosis Experiment in Orbit, Dr, Reginald M, Gorczynski & Dr, Harvey Moldofsky, University Health Network, Toronto, Ont., Canada, CSA
- Stress responses, homeostasis and integrative physiology/Educational**
- Ant Colony, students, G.W, Fowler High School, Syracuse, NY, Syracuse University plus local corporate sponsors
- Astrospiders—Spiders in Space, students, Glen Waverley Secondary College, Royal Melbourne Institute of Technology, Royal Melbourne Zoo, Melbourne, Australia, RMIT, RMZ
- Carpenter Bees In Space, students, Form 4a, Liechtensteinisches Gymnasium, Vaduz, Liechtenstein, Liechtensteinische VP Bank
- Flight of the Medaka Fish, Maki Niihori (biology student), Ochanomizu University, Tokyo, Japan, Japan Space Utilization Promotion Center (JSUP)
- Silkworm Lifecycle During Space Flight, students (initiator: 5th grade student Li Taotao), Jingshan School, Beijing, China, China Time Network Co, Ltd.
- Stress responses, homeostasis and integrative physiology**
- 10-I, Multiparametric Assessment of the Stress Response in Astronauts During Spaceflight, Massimo Pagani, M.D., Ph.D., University of Milan, Milan, Italy, ESA
- BACTER, Bacterial Physiology and Virulence on Earth and in Microgravity, Barry H, Pyle, Ph.D., Montana State University, Bozeman, MT, NASA
- BDS-05, Biotechnology Cell Science Payload (Bioreactor), Leland Cheung, Emory University, Atlanta, GA, NASA
- BIOKIN-3, Determination of the Space Influence on Bacterial Growth Kinetics, J, van der Waarde, Bioclear B.V., University of Gronigen, Gronigen, The Netherlands, ESA
- CEBAS, Immunological Investigations with *Xiphophorus helleri*, R, Goerlich, Univ, of Dusseldorf, Dusseldorf, Germany, DLR
- CEBAS, Plant Physiological Experiments with *Ceratophyllum demersum*, H, Levine, Dynamac Corp., Kennedy Space Center, FL, DLR
- CEBAS, Reproductive Biological and Embryological Research in *Xiphophorus helleri*, V, Bluem, Ruhr University, Bochum, Germany, DLR
- DSO 632B, Pharmacokinetics & Contributing Physiologic Changes During Spaceflight, Lakshmi Putcha, Ph.D., NASA Johnson Space Center, Houston, TX, NASA
- E057, Renal Stone Risk During Spaceflight: Assessment and Countermeasure Validation, Peggy A, Whitson, Ph.D., NASA Johnson Space Center, Houston, TX, NASA
- E210, Flight Induced Changes in Immune Defenses, Duane Pierson, Ph.D., NASA Johnson Space Center, Houston, TX, NASA
- E240, Spaceflight Effects on Fungal Growth, Metabolism, and Sensitivity to Antifungal Drugs, Michael R, McGinnis, Ph.D., Univ, of TX Medical Branch, Galveston, TX, NASA
- E394, Sleep-Wake Actigraphy and Light Exposure During Spaceflight, Charles A, Czeisler, Ph.D., M.D., Brigham and Women's Hospital, Harvard Medical School, Cambridge, Mass., NASA
- 98-E409, Choroidal Regulation Involved in the Cerebral Fluid Response to Altered Gravity, Jacquelin Gabrion, Ph.D., Institut des Neurosciences, Centre National de Recherche Scientifique, Paris, France, CNES
- E409, Incidence of Latent Virus Shedding During Spaceflight, Duane Pierson, Ph.D., NASA Johnson Space Center, Houston, TX, NASA
- E562, Effects of Microgravity on Microbial Physiology, Randolph W, Schweickart, Ph.D., ICOS Corp., Bothell, WA, NASA
- LEUKIN, Role of Interleukin-2 Receptor in Signal Transduction and Gravisensing Threshold in T-Lymphocytes, A, Cogoli, ETH, Zurich, Switzerland, ESA
- RADCELLS, Biological Dosimetry in Space Using Haemopoietic Stem Cell Functions, P.v, Oostveldt & A, Poffijn, Gent, Gent, Belgium, ESA
- REPAIR, Fidelity of DNA Double-Strand Break Repair in Human Cells Under Microgravity, J, Kiefer, University of Giessen, Giessen, Germany, ESA
- STROMA, Bone Marrow Stromal Cells Differentiation and Mesenchymal Tissue Reconstruction in Microgravity, R, Cancedda, University of Genova, Genova, Italy, ESA
- YSTRES, Yeast Cell Stress Under Microgravity, I, Walther, ETH, Zurich, Switzerland, ESA
- Support systems**
- Ergometer & Advanced Respiratory Monitoring System, ESA
- EOR/F, Enhanced Orbiter Refrigerator/Freezer, NASA Johnson Space Center, Houston, TX, NASA
- TEHM, Thermoelectric Holding Module, NASA Johnson Space Center, Houston, TX, NASA

Note: This is a complete listing of experiments planned for STS-107. It includes non-NASA government, commercial, and international payloads. The subheadings reflect a general breakdown and not the managerial divisions that NASA

employs for its own payloads. In general, each listing gives the acronym name likely to be used during air-to-ground conversations, the formal title, the name and affiliation of the principal investigator(s), and the payload sponsor.

## Earth & Space Sciences

### Atmospheric

MEIDEX, Mediterranean Israeli Dust Experiment, Joachim H. Joseph, Ph.D., Tel Aviv Univ., Tel Aviv, Israel, NASA  
SIMPLEX, Shuttle Ionospheric Modification with Pulsed Local Exhaust Experiment, USA, Space Test Program, Kirtland AFB, Albuquerque, NM, USAF  
SOLSE-2, Shuttle Ozone Limb Sounding Experiment, Dr. Ernest Hilsenrath and

Dr. Richard McPeters, NASA Goddard Space Flight Center, Greenbelt, MD USA, NASA

### Solar

SOLCON-3, Solar Constant Experiment, Dr. Alexandre Joukoff, Royal Meteorological Institute of Belgium, Brussels, Belgium, NASA

## Physical Sciences

### Crystallography and Molecular Structure/Educational

The Chemical Garden, 35 @ 8th-grade students, ORT Kiryat Motzkin Middle School (teacher: Dr. Birnbaum), Technion University (Prof. Eliezer Kolodne), Kiryat Motzkin, Israel, Technion University, Haifa

APCF, X-Ray Crystallography at Atomic Resolution, Molecular Mechanism of Ca/Mg Exchange with the EF-Hand Parvalbumin, J.P. Declercq, University of Louvain, Louvain, Belgium, ESA

### Crystallography and Molecular Structure

APCF (Advanced Protein Crystallization Facility), Crystal Structure Analysis of the Outer Surface Glycoprotein of the Hyperthermophile Methanothermus Fervidus, J.P. Declercq, University of Louvain, Louvain, Belgium, ESA  
APCF, Crystallization of Enzyme and Substrate-Analog Complexes for Highest Resolution Data Collection and Refinement, C. Betzel, University of Hamburg, Hamburg, Germany, ESA  
APCF, Crystallization of Photosystem I under Microgravity, P. Fromme, University of Berlin, Berlin, Germany, ESA  
APCF, Effect of Different Conditions on the Quality of Thaumatin and Aspartyl-tRNA Synthetase Crystals Grown in Microgravity, R. Giege & N. Lorber, Institut de Biologie Moleculaire et Cellulaire du CNRS, Paris, France, ESA  
APCF, Solution Flows and Molecular Disorder of Protein Crystals Growth of Ferritin Crystals, S. Weinkauf, University of Munich, Munich, Germany, ESA  
APCF, Testing New Trends in Microgravity Protein Crystallization: Comparison of Long Chambers With and Without Capillaries, J.M. Garcia-Ruiz & S. Weinkauf, University of Granada & University of Munich, Granada & Munich, Spain & Germany, ESA  
APCF, Testing New Trends in Microgravity Protein Crystallization: Solution Flows and Molecular Disorder of Protein Crystals - Growth of High-quality Crystals and Motions of Lumazine Crystals, J.M. Garcia-Ruiz & S. Weinkauf, University of Granada & University of Munich, Granada & Munich, Spain & Germany, ESA

### Physical processes

CVX-2, Critical Viscosity of Xenon-2, Robert F. Berg, Ph.D., National Institute of Standards and Technology, Gaithersburg, MD, NASA  
FAST, Adsorption Dynamics and Transfer at Liquid/Liquid Interfaces, L. Liggieri +3, ICFAM-CNR, Genova, Italy, ESA  
FAST, Dilational Properties of Interfaces, R. Miller +2, MPI-KG, Berlin, Germany, ESA  
FAST, Interfacial Rheology and the Effects of Vibrations on Interfacial Properties, G. Loglio +2, UFIR-DCO & IROE-CNR, Firenze, Italy, ESA  
LSP, Laminar Soot Processes, G.M. Faeth, Ph.D., Univ. of Michigan, Ann Arbor, MI, NASA  
MGM, Mechanics of Granular Materials, Stein Sture, Ph.D., Dept. of Civil, Environmental and Architectural Engineering, Univ. of Colorado at Boulder, Boulder, Colorado, NASA  
SOFBALL, Structures of Flame Balls at Low Lewis-number, Paul D. Ronney, Ph.D., University of Southern CA, Los Angeles, CA, NASA

### Support systems

SAMS-FF, Space Acceleration Measurement System Free Flyer. Robert J. Sicker, NASA Glenn Research Center. Cleveland, OH, NASA  
OARE, Orbiter Acceleration Research Experiment. Robert J. Sicker, NASA Glenn Research Center. Cleveland, OH, NASA

## Space Product Development

### Biological processes

AST 10/1, Astroculture™ 10/1, Plant Growth Experiment, Dr. Weija Zhou, Wisconsin Center for Space Automation and Robotics, College of Engineering, Univ. of Wisconsin, Madison, Madison, Wisconsin, NASA  
AST 10/2, Astroculture™ 10/2, Gene Transfer Experiment, Dr. Weija Zhou, Wisconsin Center for Space Automation and Robotics, College of Engineering, Univ. of Wisconsin, Madison, Madison, WI, NASA

CPCG-PCF, Commercial Protein Crystal Growth-Protein Crystal Facility, Larry DeLucas, Ph.D., Center for Biophysical Sciences and Engineering (CBSE), University of AL-Birmingham, Birmingham, AL, NASA

### Crystallography and Molecular Structure

CIBX-2, Commercial ITA Biological Experiments-2, Bence Jones Protein Crystal Growth Project, Dr. Allen Edmundson, Oklahoma Medical Research Foundation, Oklahoma City, OK, NASA  
CIBX-2, Commercial ITA Biological Experiments-2, Urokinase Protein Crystal Growth Project, ITA, Instrumentation Technology Associates, Inc., Exton, PA, NASA  
CMPCG, Commercial Macromolecular Protein Crystal Growth, L. DeLucas, Ph.D., University of AL-Birmingham and seven others, Birmingham, AL, NASA

### Drug Delivery

CIBX-2, Commercial ITA Biological Experiments-2, Microencapsulation of Drugs, Dr. Denis Morrison, NASA Johnson Space Center, Institute for Research, Inc., and ITA Inc., Houston, TX, and Exton, PA, NASA

### Physical processes

Mist, Water Mist Fire Suppression Experiment, J. Thomas McKinnon, Ph.D., Center for Commercial Applications of Combustion in Space (CCACS), Colorado School of Mines, Golden, Colorado, NASA  
ZCG, Zeolite Crystal Growth Furnace, Albert Sacco, Ph.D., Center for Advanced Microgravity Materials Processing (CAMMP), Northeastern Univ., Boston, MA, NASA

## Technology Development

### Attitude Control

STARNAV, Star Navigation, Texas A&M University, College Station, TX, CSCE/SPACEHAB

### Communications

LPT, Low Power Transiever, NASA Goddard Space Flight Center, Greenbelt, MD, NASA  
MSTRS, Miniature Satellite Threat Reporting System, Patrick Serna, Air Force Research Laboratory, Albuquerque, NM, U.S. Air Force

### Educational

SEM-14, Space Experiment Module, 11 elementary and middle schools, Houston, TX, NASA  
Environmental control  
VCD, Vapor Compression Distillation Flight Experiment, NASA Johnson Space Center, Houston, TX, NASA  
COM2PLEX, Combined Two-Phase Loop Experiment, Reinhard Schlitt, OHB GmbH, Bremen, Germany, ESA

### Satellite sensor calibration

RAMBO, Ram Burn Observation, USAF Space and Missile Center, Los Angeles, CA, U.S. Air Force