



Appendices

Appendix 1: Office of the Inspector General Summary of Serious Management Challenges

National Aeronautics and
Space Administration

Office of Inspector General
Washington, DC 20546-0001



OCT 29 2004

TO: Administrator
FROM: Inspector General
SUBJECT: Most Serious Management and Performance Challenges

These are our views, pursuant to the Reports Consolidation Act of 2000, of NASA's most serious management and performance challenges. These challenges include areas where management is working to improve Agency programs by implementing recommendations of the Columbia Accident Investigation Board (CAIB), providing for effective financial management, and enhancing controls over assets and information technology. We believe that meeting these challenges is critical in building a sound foundation for implementing the President's Space Exploration Vision in the years to come. The four challenges are listed below and summarized in the enclosure.

- Correcting serious cultural, organizational, and technical deficiencies that will enable the Space Shuttle to return to flight safely
- Achieving U.S. Core Complete on the International Space Station with the uncertain timing of Space Shuttle operations
- Ensuring that the integrated financial management system improves NASA's ability to allocate costs to programs, efficiently provides reliable information to management, and supports compliance with the Chief Financial Officers Act
- Continuing efforts to enhance information technology security by addressing weaknesses in controls

In previous years, we identified the need to improve controls over property held by Agency contractors as a separate challenge but this year we are addressing it as an element within the overall financial management challenge. We believe this is more appropriate given the amount of NASA property held by contractors and the relative importance of this issue to NASA's ability to improve financial management.

We also deleted the following challenge that we included last year: "Ensuring NASA's facilities are efficiently used and contribute to fulfillment of the Agency's mission." While facilities remain an important issue for the Agency, we do not believe that the challenge is as serious as the other management and performance issues we have identified. Also, NASA formed a Real Property Mission Analysis Team that is reviewing facilities at all Centers and

will make recommendations to senior Agency officials on improving facilities management. The team is considering observations from a prior Facilities Tiger Team (that conducted an initial review of facilities) and from NASA's real property business plan (which lists improvements needed to better manage the Agency's facilities and land). We will continue to monitor facilities issues as the Agency moves to implement the Space Exploration Vision.

If you have any questions, or need additional information, please call me at 202-358-1220.



Robert W. Cobb

Enclosure

NASA's Most Serious Management and Performance Challenges

Correcting serious cultural, organizational, and technical deficiencies that will enable the Space Shuttle to return to flight safely.

The Columbia Accident Investigation Board (CAIB) conducted an extensive examination of the February 1, 2003, loss of the Space Shuttle *Columbia* and its seven-member crew. NASA has significant actions underway to address the CAIB recommendations, including establishment of a Return-to-Flight (RTF) Planning Team, Space Flight Leadership Council, and RTF Task Group. Safely returning the Shuttle fleet to flight will require that the Agency address numerous organizational and technical challenges. Unintended consequences of changes will have to be contemplated. Also, NASA will need to exercise due diligence to ensure that engineering and safety decisions are not unreasonably affected by the cost and schedule pressures associated with events outside the Shuttle Program's control, such as budget decisions or supply shortages on the International Space Station. In addition, the Shuttle fleet is aging and will eventually be replaced by a new transportation system. Sustainability of reasonably safe flight in the context of program closeout will be an additional challenge that the Agency must address.

As of October 29, 2004, the RTF Task Group has conditionally closed 5 of the 15 RTF recommendations made by the CAIB. NASA still has substantial work to perform in addressing technical issues raised by the CAIB. For example, NASA recently determined that the size of the maximum foam debris that can be shed from the external tank must be about 25 percent smaller than the debris size previously thought to be acceptable. NASA faces additional challenges with the on-orbit inspection and repair of tile and reinforced carbon-carbon (RCC) panels. The Shuttle Program has yet to fully align the Orbiter Boom Sensor System with the evolving on-orbit detection requirements for damage to tile and the RCC. While testing is currently being conducted to better define both, there is concern that the two may not fully converge along the current RTF timeline. Also, NASA is pursuing multiple tile and RCC repair concepts. However, these repair concepts are expected to have limitations and are too early in development to forecast a completion date. For example, NASA has encountered problems applying the tile repair material in a vacuum.

The CAIB report also found that organizational issues and culture were as much a cause of the *Columbia* accident as the external tank foam. Because of the critical importance of organizational and cultural changes, the CAIB required that NASA prepare a detailed plan for addressing those issues prior to returning to flight. The Administrator has stated that the issue is sufficiently important that implementation of the plan must take place prior to return to flight. To address the CAIB's concerns, the Associate Administrator for Safety and Mission Assurance released a draft plan to address the organizational causes of the Columbia accident. The plan was to serve as the basis for establishing independent technical authority and safety functions for all NASA Enterprises. However, during September 2004, the NASA Administrator advised senior Agency officials that the draft Independent Technical Authority (ITA) plan must be significantly revised. Agency oversight groups had objected to various

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provisions in the draft plan. Accordingly, NASA still has work to do to design an acceptable ITA plan. The Deputy Chief Engineer is in the process of revising the plan.

As part of our ongoing review of RTF activities, we also identified management challenges related to the safety and quality assurance of space flight hardware. For example, our review of records for the Solid Rocket Booster bolt catchers manufactured from 1995 through 1998 identified several deficiencies. We found that the Defense Contract Management Agency (DCMA) did not perform mandatory hardware inspections on bolt catchers used in Space Shuttle operations. When inspections were performed, we found that DCMA Quality Assurance Representatives were not always adequately trained to perform the types of inspections delegated. We also found that NASA relied entirely on DCMA to provide surveillance of bolt catcher manufacturing without the oversight that NASA regulations required. Because of the flawed inspection process, DCMA should have rejected all of the bolt catchers manufactured from 1995 to 1998, including those used on the Space Shuttle *Columbia* during STS 107. The CAIB also identified problems with certification, quality assurance, and safety margins for bolt catchers and recommended that NASA test and qualify flight hardware bolt catchers prior to returning to flight.

Achieving U.S. Core Complete on the International Space Station with the uncertain timing of Space Shuttle operations.

Uncertainties about the timing for returning the Shuttle fleet to flight and resuming servicing mission for the International Space Station (ISS) will pose formidable challenges for achieving U.S. Core Complete and managing the ISS Program schedule and cost. NASA's ISS corrective action plan, which was prepared prior to the *Columbia* accident, does not consider the schedule and cost impact of the Shuttle fleet's grounding on the ISS Program. Because the core complete milestone slips further for each day the Shuttle fleet is grounded, the Program schedule is currently more than 2 years off track, and the cost impact will be significant. The \$200 million budget cut to program reserves significantly reduces the financial margin recommended by the ISS Management and Cost Evaluation Task Force, adding more cost risk to a program with a history of cost overruns.

The ISS was designed to be resupplied by the Shuttle. Consequently, the ISS Program has been forced to deal with increasing operational and safety risks as a result of inadequacies in the current resupply capabilities. For example, the first of the four gyroscopes broke 2 years ago as a result of a bearing failure, and a second stopped working in April 2004 as a result of a power failure. Flight controllers had to rely on the remaining two gyroscopes (the minimum required) to keep the ISS correctly in orbit. ISS crewmembers repaired the second gyroscope during an extra-vehicular activity (EVA) that required both crewmembers to leave the interior of the ISS unattended for several hours and to traverse an unusually hazardous EVA route. Although three gyroscopes are now working, one has exhibited power surges and vibrations. NASA's plan to replace all of the gyroscopes with newer models must await resumption of Shuttle flights because the gyroscopes are too large for the Russian's resupply vehicle, "Progress." In addition, the ISS has experienced difficulty with the Russian-made Elekron oxygen-generating unit, which processes the crew's breathing oxygen. After several attempts, the crew partially restored the unit's operation.

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Ensuring that the integrated financial management system improves NASA's ability to allocate costs to programs, efficiently provides reliable information to management, and supports compliance with the Chief Financial Officers Act.

During fiscal year (FY) 2003 NASA completed its implementation of the Integrated Financial Management Program (IFMP) Core Financial Module to replace the 10 separate legacy accounting systems. The Core Financial Module is the backbone of the IFMP, providing a NASA-wide, fully integrated accounting system that the Agency previously lacked. The new system was intended, among other things, to produce auditable financial statements and eliminate reporting weaknesses identified in prior year financial statement audits. However, serious deficiencies continue to exist.

NASA has been unable to generate useful financial statements from data in the Core Financial Module. The system-generated statements contained fundamental errors and data upon which management could not rely. These errors included a Balance Sheet that did not balance, line items within the Statement of Budgetary Resources that did not equal, and different amounts for the same line item on two separate financial statements. As a result, interim financial statements submitted to the Office of Management and Budget were developed using estimates. The FY 2004 year-end statements note that many accounts are misstated due to data integrity issues from FY 2003. NASA has specifically identified misstatements in amounts reported on the Statement of Budgetary Resources and has indicated that data are not available to prepare required supplementary information on the Agency's major budget accounts.

In August 2004, the independent auditor notified the Office of Inspector General and NASA management that a disclaimer of opinion would be issued on the FY 2004 financial statements. In addition to the lack of auditable financial statements and unreliable data within the Core Financial Module, the independent auditor identified deficiencies with policies and procedures and audit documentation in critical areas. The independent auditor found inconsistencies in NASA's policies and procedures in the accounting for environmental liabilities, along with the insufficiency of documentation to support amounts recorded. In the property area, questions have been raised about a \$1.7 billion adjustment to properly classify research and development costs that were previously capitalized, as well as the accounting for internal use software, specifically the cost of the IFMP.

As in the last 3 years, NASA's independent auditor reported that the Agency's controls over contractor-held property, plant, and equipment are weak and do not ensure that information provided for inclusion in the financial statements is reliable and complete. NASA is placing significant reliance on contractor reporting. Although NASA implemented a plan to have the Defense Contract Audit Agency perform internal control reviews at NASA contractors, most of the reviews are based on information as of March 31, 2004, and will not include tests of transactions for the subsequent period through September 30, 2004. Until NASA successfully implements a single, integrated system for reporting contractor-held property, the Agency will continue to experience problems with the consistency of information reported by its contractors.

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NASA must also address a significant human capital shortage in the Office of the Chief Financial Officer (OCFO). About 40 percent of the positions in the OCFO are unfilled, including three key leadership positions. Without sufficient and adequately trained staff, the office will not be able to provide effective leadership to implement policies and procedures, perform oversight of financial management at NASA centers, and monitor the quality of data generated by the financial system. In addition, staffing shortages in key leadership positions may limit the ability of the OCFO to adequately monitor contractors hired to alleviate staffing vacancies.

Continuing efforts to enhance information technology security by addressing weaknesses in controls.

NASA's leadership has implemented several information technology security (ITS) improvements, and these positive changes should help improve NASA's overall ITS posture. However, many ITS challenges remain. Specifically, our audits and assessments found recurring and significant internal control weaknesses related to ITS, including unclear system administrator roles and responsibilities; untested contingency plans; a lack of alternate processing facilities; and inadequate implementation of host and network security, system risk assessments, system certifications, and vulnerability testing.

In addition, the independent auditor for NASA's FY 2003 financial statement audit identified several ITS deficiencies relating to the general controls environment over information technology architecture that processes financial applications. Preliminary results of the independent auditor's FY 2004 financial statement audit have also identified similar ITS deficiencies.

Because of the sensitivity of ITS vulnerabilities, we are not providing details on specific weaknesses in this document. However, we have provided the Agency detailed information on vulnerabilities and recommendations for corrective action in reports and other controlled correspondence.

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Appendix 2: Inspector General Act Amendments Reports

THE INSPECTOR GENERAL ACT AMENDMENTS

The *Inspector General Act Amendments of 1988* (P.L. 100-504) [the Act], require that Inspectors General (IG) and Agency Heads submit semi-annual reports to Congress on actions taken on audit reports issued by the Office of Inspector General (OIG). In compliance with the Act, NASA consolidated and annualized the relevant information for FY 2004, and the Agency's report follows.

REPORT ON AUDIT FOLLOW-UP

NASA management is committed to ensuring the timely resolution and implementation of OIG audit recommendations and believes that audit follow-up is essential to improving the efficiency and effectiveness of NASA programs, projects, and operations. Therefore, the Agency has implemented a comprehensive audit follow-up program to ensure that OIG audit recommendations are resolved and implemented in a timely manner.

In implementing its audit follow-up program, NASA utilizes the Corrective Action Tracking System version 2.0 (CATS II) as its primary database for monitoring OIG audit recommendations. CATS II is a Web-based application developed by NASA and maintained by the Management Systems Division.

NASA's audit follow-up program consists of a joint effort between NASA management and the OIG. As a direct result of this collaborative effort, NASA succeeded in reducing the number of open OIG audit recommendations by 75 percent from 453 recommendations in FY 2002 to 110 recommendations as of September 30, 2004. These 110 recommendations correspond to 36 audit reports that are pending final management action.

REPORTS PENDING FINAL ACTION ONE YEAR OR MORE AFTER ISSUANCE OF A MANAGEMENT DECISION

As of September 30, 2004, NASA had a total of 27 OIG reports containing 82 recommendations on which management decisions have been made, but final action has not been taken. Management continues to address diligently the recommendations put forth by the OIG. NASA is working actively to implement those recommendations.

AUDIT AND INSPECTION REPORTS PENDING FINAL ACTION
(As of September 30, 2004)

| Report Number | Report Title | Report Date |
|---------------|--|-------------|
| IGMEMO12 | Arthur Andersen Report on NASA's FY 1999 Financial Statements | 02/20/2000 |
| IG00034 | Foreign National Visitors at NASA Centers | 05/12/2000 |
| IG00057 | NASA's Planning and Implementation for Presidential Decision Directive 63—Phase I | 09/28/2000 |
| IG00055 | System Information Technology Security Planning | 09/28/2000 |
| IG00059 | Software Assurance | 09/28/2000 |
| G00021 | Assessment of NASA's Use of the Metric System | 02/20/2001 |
| IGMEMO17 | Oversight of NASA's FY 2000 Financial Statement Audit | 02/26/2001 |
| IG1021 | X-37 Technology Demonstration Project Management | 03/30/2001 |
| IG1032 | UNIX Operating System Security and Integrity in MCC JSC | 08/22/2001 |
| IG1038 | NASA's Planning and Implementation for PDD 63 | 09/27/2001 |
| G00017 | Internet Based Spacecraft Commanding Security Issues | 10/22/2001 |
| IG02004 | Approvals for Accessing Information Technology Systems at MSFC and GRC | 11/19/2001 |
| IG02011 | International Space Station Spare Parts Costs | 03/22/2002 |
| IG02010 | Telephone Management | 03/26/2002 |
| IG02017 | Management of Research Grants and Cooperative Agreements | 06/04/2002 |
| IG02028 | Space Launch Initiatives | 09/30/2002 |
| G02024 | Assessment of the JPL Firewall and Other IT Security Measures | 12/18/2002 |
| IGMEMO23 | FY 2002 NASA Financial Statement Audit | 01/23/2003 |
| IGMEMO14 | QCR: Oversight of PriceWaterhouseCoopers, L.L.P., Audit of NASA's Financial Statements for the FY Ended September 20, 2001 | 01/24/2003 |
| IGMEMO15 | FY 2001 Management Letter Comments—Internal Control | 01/24/2003 |
| IGMEMO16 | FY 2001 Management Letter Comments—IT | 01/24/2003 |
| IG03016 | QCR: Johns, Bubbers & Johns, P.A., Audit of the KSC Exchange Financial Statements for the FY Ended September 30, 2000 and September 30, 2001 | 03/26/2003 |
| IG03009 | Performance Management Related to Agency-wide FY 2002 IT Security Program Goals | 03/27/2003 |
| IG03013 | NASA Needs to Improve Waste Reduction Activities | 05/30/2003 |
| IG03017 | Information Technology Incident Response Capability Needs Improvement | 06/9/2003 |
| IG03022 | Follow-up of Disaster Recovery Planning | 08/6/2003 |
| IG03023 | Failures in Cost Estimating and Risk Management Weaknesses in Prior Space Launch Initiatives | 09/29/2003 |

**STATISTICAL TABLE ON AUDIT REPORTS WITH DISALLOWED COSTS**

(October 1, 2003 through September 30, 2004)

| | Number of Audit Reports | Dollar Value |
|---|-------------------------|--------------|
| A Audit reports with management decisions on which final action had not yet been taken at the beginning of the reporting period | 0 | \$0 |
| B Audit reports on which management decisions were made during the reporting period | 1 | \$30,563 |
| C Total audit reports pending final action during the reporting period (total of A + B) | 1 | \$30,563 |
| D Audit reports on which final action was taken during the reporting period | | |
| 1. Value of disallowed costs collected by management | 1 | \$15,292 |
| 2. Value of costs disallowed by management | 0 | \$15,271 |
| 3. Total (lines D1 + D2) | 1 | \$30,563 |
| E Audit reports needing final action at the end of the reporting period (C-D3) | 0 | \$0 |

STATISTICAL TABLE ON AUDIT REPORTS WITH RECOMMENDATIONS THAT FUNDS BE PUT TO BETTER USE

(October 1, 2003 through September 30, 2004)

| | Number of Audit Reports | Dollar Value |
|---|-------------------------|--------------|
| A Audit reports with management decisions on which final action had not yet been taken at the beginning of the reporting period | 0 | \$0 |
| B Audit reports on which management decisions were made during the reporting period | 1 | \$1,471,799 |
| C Total audit reports pending final action during the reporting period (total of A + B) | 1 | \$1,471,799 |
| D Audit reports on which final action was taken during the reporting period | | |
| 1. Value of disallowed costs collected by management | 1 | \$1,471,799 |
| 2. Value of costs disallowed by management | 0 | \$0 |
| 3. Total (lines D1 + D2) | 1 | \$1,471,799 |
| E Audit reports needing final action at the end of the reporting period (C-D3) | 0 | \$0 |

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<http://www.jpl.nasa.gov/>

NASA Lyndon B. Johnson Space Center (JSC)

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NASA John C. Stennis Space Center (SSC)

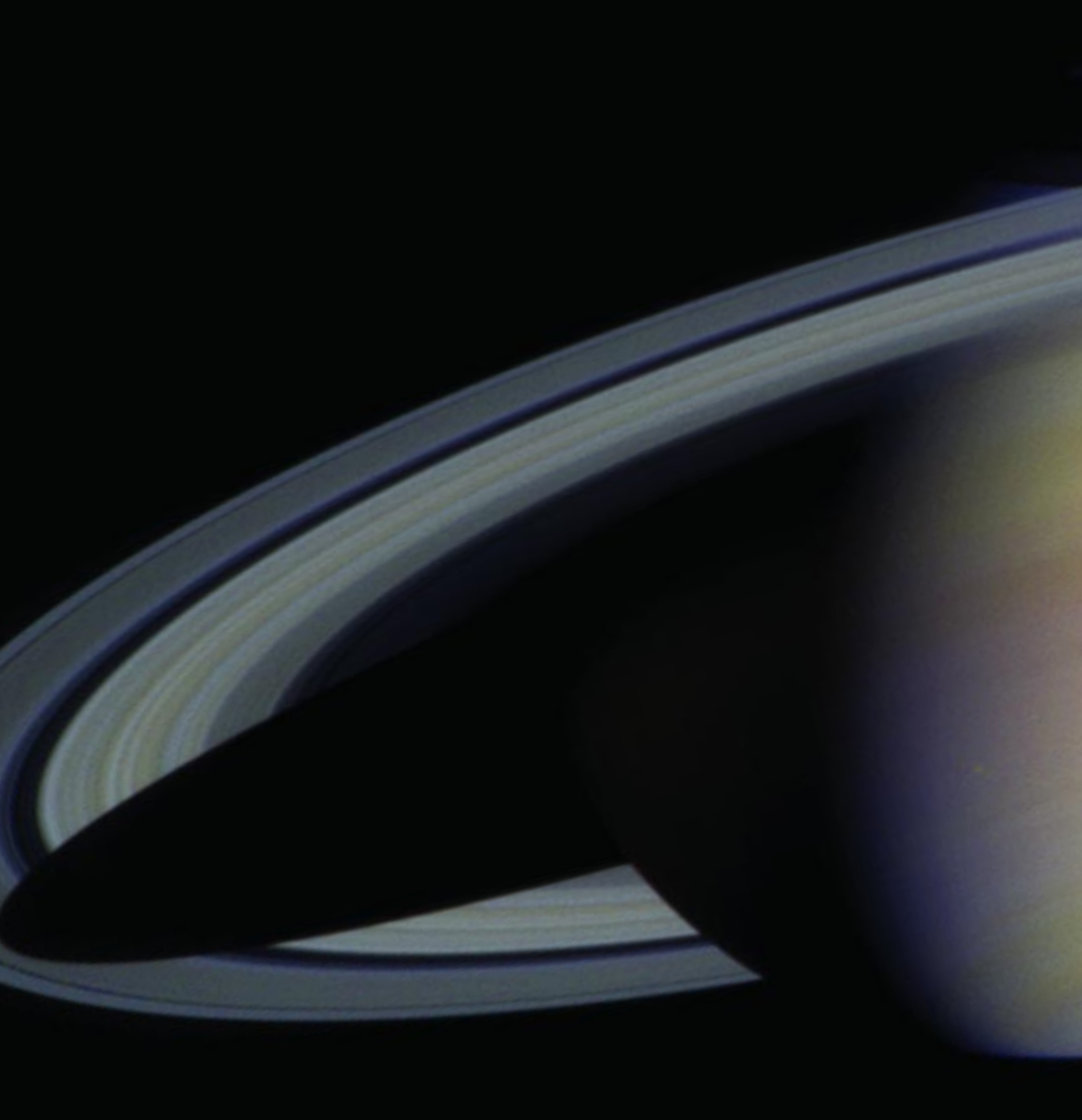
Stennis Space Center, MS 39529-6000
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The Cassini-Huygens spacecraft
took this image of Saturn as it
approached the ringed planet in
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