Fiscal Vear:	FY 2004	Task Last Undated:	FY 03/23/2006
PI Name	Dinges David F Ph D	Task East Opuateu.	1105/25/2000
Project Title:	Countermeasures to neurobehavioral deficits from cumulative effects of recovery sleep opportunities	sleep deprivation during s	pace flight: Dose-response
Division Name:	Human Research		
Program/Discipline:	NSBRI Teams		
Program/Discipline Element/Subdiscipline:	NSBRI TeamsHuman Performance Factors, Sleep, and Chro	onobiology Team	
Joint Agency Name:	·	TechPort:	Yes
Human Research Program Elements:	(1) BHP :Behavioral Health & Performance (archival in 2017)		
Human Research Program Risks:	(1) Sleep :Risk of Performance Decrements and Adverse Healt Desynchronization, and Work Overload	th Outcomes Resulting from	n Sleep Loss, Circadian
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	dinges@pennmedicine.upenn.edu	Fax:	FY
PI Organization Type:	UNIVERSITY	Phone:	215-898-9949
Organization Name:	University of Pennsylvania		
PI Address 1:	Department of Psychiatry		
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PI Web Page:			
City:	Philadelphia	State:	PA
Zip Code:	19104-4209	Congressional District:	2
Comments:			
Project Type:	Ground	Solicitation / Funding Source:	2003 Biomedical Research & Countermeasures 03-OBPR-04
Start Date:	06/01/2004	End Date:	05/31/2008
No. of Post Docs:		No. of PhD Degrees:	
No. of PhD Candidates:		No. of Master' Degrees:	
No. of Master's Candidates:		No. of Bachelor's Degrees:	
No. of Bachelor's Candidates:		Monitoring Center:	NSBRI
Contact Monitor:		Contact Phone:	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NCC 9-58-HPF00404		
Performance Goal No.:			
Performance Goal Text:			

Rationale for HRP Directed Research: Research Impact/Earth Benefits: Task Progress: New project for FY2004. Bibliography Type: Description: (Last Updated: 05/08/2025)	Task Description:	The optimal performance of astronauts during extended-duration space flight depends heavily on achieving recovery through adequate sleep. This project will develop sleep schedule countermeasures to ensure neurocognitive performance capability in astronauts during prolonged space flight. Sleep is chronically restricted in space to 4h-6h per day for reasons often associated with operational requirements. Ground-based studies reveal that such chronic sleep durations result in cumulative performance impairments. The proposed experiment will establish the countermeasure benefits for performance from an acute increase in recovery sleep duration that occurs between two periods of chronic sleep restriction. In addition, generating sleep dose-response functions will provide needed information on the adverse performance consequences of an acute reduction in sleep duration, which can occur in space flight prior to a day of critical operations. A sleep-duration, dose-response experimental approach with randomization to condition will be carried out on N=80 healthy adults (n=40 females; n=40 males). Sleep duration dose will be varied parametrically on one night (0h, 2h, 4h, 6h, 8h, 10h, or 12h), placed midway between two 6-night periods of chronic sleep restriction (4h/night). The resulting dose response curves will quantify, for the first time, the degree of recuperation and/or further decrement of neurobehavioral functions relative to varying amounts of sleep following a period of cumulative sleep loss. In addition, we will resolve whether complete neurobehavioral recovery from chronic sleep restriction is possible within two nights of extended sleep duration. Subjects will be monitored for a wide range of neurobehavioral performance for a wide range of neurobehavioral performance from ance from ance fight. The results have the potential to fill critical gaps in scientific understanding of the impact of sleep duration on recovery from prior chronic sleep debt; inform and enrich biomathematical models of performance in spa	
Research Impact/Earth Benefits: Task Progress: New project for FY2004. Bibliography Type: Description: (Last Updated: 05/08/2025)	Rationale for HRP Directed Research:		
Task Progress: New project for FY2004. Bibliography Type: Description: (Last Updated: 05/08/2025)	Research Impact/Earth Benefits:		
Bibliography Type: Description: (Last Updated: 05/08/2025)	Task Progress:	New project for FY2004.	
	Bibliography Type:	Description: (Last Updated: 05/08/2025)	