

THE UNIVERSITY OF MICHIGAN

Proposal Approval Form

(see back of form for instructions or Web Site)
www.research.PAF.umich.edu

DRDA # _____
Rec'd Date _____
Mail Date _____
DRDA Use Only

PROPOSAL TYPE /CLASS CODE

- ___ General Academic Instruction (11000)
- ___ Research Training Grant (16000)
- On-Campus Organized Research (22000)
- ___ Off-Campus Organized Research (22100)
- ___ Clinical Trial (22200)
- ___ Other Sponsored Activity (31000)

12/19/2007 7/18/06
Date Prepared Sponsor Deadline
 Receipt Date or ___ Postmark Date

If Continuation or Supplemental request, current Project/Grant No. Revised 07-0178

Sponsor Solicitation No. NNH06ZDA001N
(If appropriate)

1. DIRECT SPONSOR NASA
(see instructions)

PRIME SPONSOR (if any) _____
(see instructions)

Exact address to which proposal should be sent:

Donald Anderson, 3G84, Modeling, Analysis and Prediction(MAP), Earth Science Division,
Science Mission Directorate, NASA Headquarters, Washington DC 20546-0001

Attach sponsor guidelines or specify the URL: _____

<u>Donald Anderson</u>	<u>202-358-1432</u>	<u>202-358-2770</u>	<u>Donald.Anderson-1nasa.gov</u>
Direct Sponsor Contact Person	Contact Phone	Contact Fax	Contact Email

2. PROJECT TITLE Process-Based and Object-Based Investigation of Bias in the Simulations of the Physical clima

3. KEY TERMS THAT DESCRIBE THE PROJECT (list three keywords *not* contained in the Project Title)

4. KEY PERSONNEL

<u>Richard Rood</u>	<u>rbrood</u>	<u>AOSS</u>	<u>224000</u>	<u>647-3530</u>	<u>763-0437</u>
PRINCIPAL INVESTIGATOR	Uniqname	Department/Unit	Dept ID	Telephone	Fax
PI Rank: Instructor to Professor <input checked="" type="checkbox"/> Research Investigator to Sr. Research Scientist ___ Other (specify) _____					
<u>Natasha Andronova</u>	<u>natand</u>	<u>AOSS</u>	<u>224000</u>	<u>763-5833</u>	<u>763-0437</u>
Participating Investigator	Uniqname	Department/Unit	Dept ID	Telephone	Fax
<u>Xianglei Huang</u>	<u>xianglei</u>	<u>AOSS</u>	<u>224000</u>	<u>763-6218</u>	<u>763-0437</u>
Participating Investigator	Uniqname	Department/Unit	Dept ID	Telephone	Fax

List additional Participating Investigators under Notes (page 3)

5. ADMINISTRATIVE CONTACT (person other than the Principal Investigator, to whom questions about this project can be addressed and to whom correspondence should be sent)

Proposal:

<u>Cheri Champoux</u>	<u>hovater</u>	<u>2208 SRB 2143</u>	<u>763-6218</u>	<u>763-0437</u>
Name	Uniqname	Room / Building / Campus Zip	Telephone	Fax

Award (if different):

_____	_____	_____	_____	_____
Name	Uniqname	Room / Building / Campus Zip	Telephone	Fax

6. DOES THE PROPOSED ACTIVITY INVOLVE:

DRDA # _____

The following activities, if marked YES, may require further registration/inspection/approvals by appropriate institutional committees. Establishment of a Project/Grant Number may be delayed until approvals are granted.

- Use of human subjects/patients No Yes If yes, IRB approval number _____ date _____
- Use of vertebrate animals No Yes If yes, IACUC approval number _____ date _____
If yes, specify Exempt, Biosafety Level I, II, III or human gene transfer
- Use of recombinant DNA No Yes
- Restrictions on openness of research No Yes If yes, contact DRDA project representative _____
- Classified Research No Yes If yes, contact DRDA project representative _____
- Use of Select Agents (Biological / Toxin) No Yes
- Use of Human Embryonic Stem Cells No Yes If yes, date of ESCRO approval _____

Do you (or your family members) or any of the key investigators (or their family members) have a conflict of interest with the sponsor or any entity related to this project (e.g. equipment vendor, subcontractor, vendor of a product being evaluated by the project)? Conflicts occur when the investigators have stock or other financial interest in, receive income from, consult with, or serve as an officer, director, or advisor to the sponsor or project-related entities.

Peter B. Reed
Signature of Principal Investigator

No Yes
Please follow instructions at:
www.umich.edu/research/policies/um/conflict_procedures.html

NOTE: If this information changes during the term of the project, you must disclose such interests by following instructions at:
<http://www.research.umich.edu/policies/um/coi>

- Use of radioisotopes in or on humans No Yes If yes, date of committee approval _____
- Use of radioactive materials No Yes If yes, date of RPC approval _____
- Use of human body substances No Yes If yes, specify _____
- Use of infectious agents No Yes If yes, specify _____
- Will students work on this project? No Yes
- Is a subcontract contemplated? No Yes
- Work off University property No Yes If yes, identify location _____

Is an intellectual property disclosure related to this proposal on file in the Technology Transfer Office? No Yes

Are there any materials transfer or nondisclosure agreements in place regarding this proposal? No Yes

7. UNIVERSITY SPACE TO BE USED

Room	Building	Bldg. Zip	Approved by
1541d1541a2208,2525	Space Research Bldg.	2143	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(List additional space under NOTES)

If insufficient space is available, indicate square feet required _____

Approved by _____

8. PROPOSED PROJECT BUDGET AND TIME PERIOD		January 1, 2008	December 31, 2010
U-M Cost Sharing		Start Date	End Date
		Sponsor	Total
Total Direct Costs	\$0	\$802,830	\$802,830
Indirect Costs	$\frac{52}{\text{Indirect Cost Rate}}\%$ \$0	\$322,593	\$322,593
TOTAL	\$0	\$1,125,423	\$1,125,423

____ Check here if an indirect cost waiver is requested (please attach relevant documentation).

9. DETAILS OF UNIVERSITY DIRECT COST SHARING:

Line Item	Amount	Source	Dept ID	Approved by
_____	\$0	_____	_____	_____
_____	\$0	_____	_____	_____
_____	\$0	_____	_____	_____
_____	\$0	_____	_____	_____
Total Imputed Indirect Costs	\$0			

If there is non-University cost sharing please describe:


10. NOTES

Additional Co-I:

Christiane Jablonowski, cjablono, AOSS, 1541b SRB, 763-6238

The undersigned certify, to the best of their knowledge and belief, that no Federal appropriated funds have been or will be paid to influence or attempt to influence the granting of this award. We certify the proposed work is consistent with University unit objectives and all faculty involved in the proposal have agreed to participate. We accept the obligations and commitments described, and agree to perform the work in accordance with University and sponsor policies.

Additional certification for DHHS funds: The PI assures that (1) that the information submitted within the application is true, complete and accurate to the best of the PI's knowledge; (2) that any false, fictitious, or fraudulent statements or claims may subject the PI to criminal, civil, or administrative penalties; and (3) that the PI agrees to accept responsibility for the scientific conduct of the project and to provide the required progress reports if a grant is awarded as a result of the application.

Richard Rood  **224000**
 Requested by: Principal Investigator (also sign page 2 certification) Dept ID#

Approved for School/College by: Dean Dept ID#

Approved by: Dept or Unit Head Dept ID#
 Additional signatures, if required:

Dearborn & Flint Campuses Only: Director of Research Dept ID#

Dept ID#

Dept ID#

Dept ID#

Dept ID#

DRDA Use Only

Approved for DRDA by: Project Representative

Approved for the University

NASA PROPOSAL COVER PAGE
December 19, 2008

PI Information

Name:	Richard Rood	Email:	rbrood@umich.edu
Organization:	University of Michigan	Department:	Atmospheric, Oceanic & Space Science
Telephone:	734-647-3530	Fax:	734-763-0437
Address:	2525 Space Research Building, 2455 Hayward Street		
City, State, Zip:	Ann Arbor, Michigan 48109	Country	USA

PI Signature & Date: *Richard Rood* 12/19/07

Authorizing Official:	
Title:	
Organization:	

AO Signature & Date: _____

Business Point of Contact:	Kathryn A DeWitt	Email	dewitt@umich.edu
Title:	Project Representative	Phone:	(734) 763-6438
Institution:	Regents of the University of Michigan		
Address:	3003 South State Street, Room 1058, Ann Arbor, MI 48109-1274		

TEAM MEMBERS

Role	Name	Organization	Email Address	Telephone
Co-I	Natalia Andronova	U of M	natand@umich.edu	734-763-5833
Co-I	Xianglei Huang	U of M	xianglei@umich.edu	734-936-0491
Co-I	Christiane Jablonowski	U of m	cjablono@umich.edu	734-763-6238

Short Title:	
Full Title:	Process-based and Object-Based Investigation of Bias in the Simulations of the Physical Climate

Start Date:	January 1, 2008	End Date:	December 31, 2010
Has this proposal been submitted to other organizations or NASA installations?			no
If yes, whom?			

Total Estimated Cost:	\$1,125,423
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Name of Institution:	Regents of the University of Michigan
Institution Type:	Educational, Non-Profit

Cage Code:	03399
DUNS Number:	073133571
TIN Number:	38-600-6309

NASA CONTACT PERSON

Name:	Donald Anderson	Email:	Donald.Anderson-1@nasa.gov
Title:	Earth Science Division	Telephone:	202-358-1432
Organization:	Science Mission Directorate	Fax:	202-358-2770
Address:	NASA Headquarters		
City, State, Zip:	Washington, DC 20546-0001	Country:	

New Proposal:	revised	Renewal/Continuation:	
Predecessor Information:			

Research Category:	Modeling, Analysis and Prediction 9MAP)
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International Participation & Description:	NO
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U.S. Government Agency Participation:	NO
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BUDGET SUMMARY

Type	Year 1	Year 2	Year 3	Year 4	Total
Direct Labor	\$169,098	\$171,920	\$169,512		\$510,530
Other Direct Costs - Subcontracts	58,110	60,488	62,632		181,230
Other Direct Costs - Consultants					
Other Direct Costs - Equipment					
Other Direct Costs - Supplies	5,765	8,819	8,655		23,239
Other Direct Costs - Travel	19,735	20,525	21,345		61,605
Other Direct Costs - Other, Tuition	8,238	8,732	9,256		26,226
Indirect Costs	114,191	104,656	103,746		322,593
Other Applicable Costs					
Subtotal - Estimated Costs:	\$375,137	\$375,140	\$375,146		\$1,125,423
Less: Proposed Cost Sharing - Cost Sharing:					
Budget Total	\$375,137	\$375,140	\$375,146		\$1,125,423

Modifications to the work plan described in the original proposal

Richard B. Rood

December 18, 2007

 12/19/07

The work will focus on the tropical clouds and will defer or eliminate the work on clouds and precipitation in the eastern United States. From an instrument point of view, the work will focus on CERES with less attention to AIRS. This impacts primarily tasks A.5, and especially B, which is significantly reduced.

Therefore:

Support for Xianglei Huang is reduced to 0.5 months.

Support for student at Michigan is reduced from full time to part time.

Modifications:

The support for Kuan-man Xu at NASA Langley will be provided directly to Langley under a separate funding vehicle. Support for Kuan-man Xu is eliminated from this proposal.

Derek Posselt has joined the University of Michigan as an Assistant Research Professor. This proposal will provide Dr. Posselt's support. He will work on the tropical cloud objects and model intercomparisons. This funding was labeled as Post-doc in the original proposal.

William Collins has moved from NCAR to University California at Berkeley. Full support for a student will be provided for Collins.

Support for the investigation of the role of dynamical cores in the research is enhanced. Support for Christiane Jablonowski is added.

Richard Rood's funding has been reduced from 3 summer months to one.

Natalia Andronova's funding has been reduced from 4 months to one.

Process-Based and Object- Based Investigation of Bias in the Simulations of the Physical Climate

a proposal to
NASA ROSES

Performance Period: January 1, 2008 through December 31, 2010

FY08 Rate/ Hour	Labor Hours	Year 1			Year 2			Year 3			Budget Totals		Base Salary			
		Subtotals Cost	benefits		Labor Hours	Subtotals Cost	benefits	Labor Hours	Subtotals Cost	benefits	Hours	Dollars	yr1	yr2	yr3	
Salaries and Benefits:																
Principal Investigator:	R.Rood	\$104.17	173	18,742	5,623	173	19,492	5,848	173	20,272	6,082	519	58,506	\$162,500	\$162,240	\$168,730
CO-Investigator:	N. Andronova	\$51.80	213	11,475	3,443	161	9,020	2,706	112	6,526	1,958	486	27,021	\$107,750	\$108,160	\$112,486
CO-Investigator:	Xianglei Huang	\$54.67	86	4,702	1,411	86	4,890	1,467	86	5,085	1,526	258	14,677	\$85,280	\$86,320	\$89,773
CO-Investigator:	C.Jablonowski	\$54.80	86	4,713	1,414	86	4,901	1,470	86	5,097	1,529	258	14,711	\$85,490	\$86,320	\$89,773
Collaborator	J.Potter, LLNL J. Bacmeister,			0			0			0		0				
Collaborator	NASA/GSFC		0			0			0			0				
Administrator	Champoux	\$36.20	104	3,878	1,163	104	3,915	1,175	104	4,072	1,222	312	11,865			
Research Scientist	D.Posselt	\$32.69	2,080	70,715	21,215	2,080	73,544	22,063	2,080	76,485	22,946	6,240	220,744			
Graduate Research Assistant	?	\$23.87	664	15,850		664	16,484		498	12,857		1,826	45,191			
Undergraduate	(hourly temp appt)											0				
Total Salaries			3,406	130,075		3,354	132,246		3,139	130,394		9,899	392,715			
Benefits on Salaries		30%		39,023			39,674			39,118			117,815			
GRA Tuition & Fees		8,238	1 term	8,238		1 term	8,732		1 term	9,256		3 term	26,226			
Total Salaries and Benefits				177,336			180,652			178,768			536,756			
Supplies and Services:																
AOSSnet connect & maintenance (DP)				5,075			4,997			4,677			14,749			
B&W and color duplication (RS)		\$15/mnth		180			187			195			562			
Shipping (Fed Ex, freight) (RS)		\$15/mnth		180			187			195			562			
TeleCommunications (Toll Charges) RS		\$15/mnth		180			187			195			562			
General Research Supplies (RS)		\$15/mnth		150			141			148			439			
Page Costs/Reprints/Typesetting (RS)		\$150/page				20	3,120		20	3,245			6,365			
Total Supplies and Services				5,765			8,819			8,655			23,239			
Travel and Living:																
RT/year Ann Arbor- AGU, San Francisco		\$688	trps/yr	1	688	trps/yr	1	716	trps/yr	1	744		2,148			
RT/year Ann Arbor-NASA GSFC		\$250	3	750		3	780		3	811			2,341			
RT/year Ann Arbor-Boulder,NCAR		\$530	2	1,060		2	1,102		2	1,146			3,308			
			dys/trp			dys/trp			dys/trp							
Subsistence (San Francisco)		\$194/day	6	1,164		6	1,211		6	1,259			3,634			
Subsistence (Baltimore,MD)		\$200/day	30	6,000		30	6,240		30	6,490			18,730			
Subsistence (Boulder,CO)		\$144/day	37	5,328		37	5,541		37	5,763			16,632			
Local Transportation (Rental, Parking, Fuel, Mileage)		\$65/day	73	4,745		73	4,935		73	5,132			14,812			
Total Travel and Living				19,735			20,525			21,345			61,605			
Subcontracts																
NCAR, William Collins				58,110			60,488			62,632			181,230			
Total Subcontracts				58,110			60,488			62,632			181,230			
Total Direct Cost (TDC)				260,946			270,484			271,400			802,830			
Modified Total Direct Cost (MTDC)				194,598			201,264			199,512			595,374			
Indirect Cost on MTDC		52.0%		101,191		52.0%	104,656		52.0%	103,746			309,593			
Indirect Cost on Subcontracts @ 52% of \$25k				13,000									13,000			
Total U of M Program Budget				375,137			375,140			375,146			1,125,423			
Inter-agency Transfer																
NASA Langley, Kuan-Man Xu				0			0			0						
Total Inter-agency transfer				0			0			0						
Total Project Budget				375,137			375,140			375,146			1,125,423			

BUDGET SUMMARY for Research Proposal

For Year of

from to
(M/D/YY) (M/D/YY)

NASA USE ONLY

	A	B	C
1. <u>Direct Labor</u> (salaries, wages and fringe benefits)	169,098		
2. <u>Other Direct Costs:</u>			
a. Subcontracts	58,110		
b. Consultants			
c. Equipment			
d. Supplies	5,765		
e. Travel	19,735		
f. Other: tuition	8,238		
3. <u>Facilities and Administrative Costs</u>	114,191		
Rate <input type="text" value="52.0%"/> Base MTDC <input type="text" value="194,598"/>			
Rate <input type="text" value="52.0%"/> Base Sub/C <input type="text" value="25,000"/>			
4. <u>Other Applicable Costs:</u>			
5. <u>SUBTOTAL -- Estimated Costs</u>	375,137		
6. <u>Less Proposed Cost Sharing (if any)</u>			
7. <u>Carryover Funds</u> (if any)			
a. Anticipated amount:			
b. Amount to reduce budget			
8. <u>Total Estimated Costs</u>	375,137		XXXXXX
9. APPROVED BUDGET	XXXXXX	XXXXXX	

Principal Investigator:

Proposal Title:

BUDGET SUMMARY for Research Proposal

For Year of
 from to
 (M/D/YY) (M/D/YY)

NASA USE ONLY

	A	B	C
1. <u>Direct Labor</u> (salaries, wages and fringe benefits)	171,920		
2. <u>Other Direct Costs:</u>			
a. Subcontracts	60,488		
b. Consultants			
c. Equipment			
d. Supplies	8,819		
e. Travel	20,525		
f. Other: tuition, fees	8,732		
3. <u>Facilities and Administrative Costs</u>	104,656		
Rate <input type="text" value="#REF!"/> Base MTDC <input type="text" value="201,264"/>			
Rate <input type="text" value="#REF!"/> Base Sub/C <input type="text"/>			
4. <u>Other Applicable Costs:</u>			
5. <u>SUBTOTAL -- Estimated Costs</u>	375,140		
6. <u>Less Proposed Cost Sharing (if any)</u>			
7. <u>Carryover Funds (if any)</u>			
a. Anticipated amount:			
b. Amount to reduce budget			
8. <u>Total Estimated Costs</u>	375,140		XXXXXX
9. APPROVED BUDGET	XXXXXX	XXXXXX	

Principal Investigator:

Proposal Title:

BUDGET SUMMARY for Research Proposal

For Year of
 from to
(M/D/YY) (M/D/YY)

NASA USE ONLY

	A	B	C
1. <u>Direct Labor</u> (salaries, wages and fringe benefits)	169,512		
2. <u>Other Direct Costs:</u>			
a. Subcontracts	62,632		
b. Consultants			
c. Equipment			
d. Supplies	8,655		
e. Travel	21,345		
f. Other: tuition, fees	9,256		
3. <u>Facilities and Administrative Costs</u>	103,746		
Rate <input type="text" value="#REF!"/> Base MTDC <input type="text" value="199,512"/>			
Rate <input type="text" value="#REF!"/> Base Sub/C <input type="text"/>			
4. <u>Other Applicable Costs: Indirect Costs</u>			
5. <u>SUBTOTAL -- Estimated Costs</u>	375,146		
6. <u>Less Proposed Cost Sharing (if any)</u>			
7. <u>Carryover Funds (if any)</u>			
a. Anticipated amount:			
b. Amount to reduce budget			
8. <u>Total Estimated Costs</u>	375,146		XXXXXX
9. APPROVED BUDGET	XXXXXX	XXXXXX	

Principal Investigator:

Proposal Title:

BUDGET SUMMARY for Research Proposal

For Total Period of Performance from

01/01/08 to 12/31/10
(M/D/YY) (M/D/YY)

NASA USE ONLY

	A	B	C
1. <u>Direct Labor</u> (salaries, wages and fringe benefits)	510,530		
2. <u>Other Direct Costs:</u>			
a. Subcontracts	181,230		
b. Consultants			
c. Equipment			
d. Supplies	23,239		
e. Travel	61,605		
f. Other: tuition, fees	26,226		
3. <u>Facilities and Administrative Costs</u>	322,593		
Rate	52.0%	Base MTDC	595,374
Rate	52.0%	Base Sub/C	25,000
4. <u>Other Applicable Costs:</u>			
5. <u>SUBTOTAL -- Estimated Costs</u>	1,125,423		
6. <u>Less Proposed Cost Sharing (if any)</u>			
7. <u>Carryover Funds (if any)</u>			
a. Anticipated amount:			
b. Amount to reduce budget			
8. <u>Total Estimated Costs</u>	1,125,423		XXXXXX
9. <u>APPROVED BUDGET</u>	XXXXXX	XXXXXX	

Principal Investigator: Richard Rood

Proposal Title: Process-Based and Object-Based Investigation of bias in the Simulations of the Physical Climate