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**Return of Private Foundation  
or Section 4947(a)(1) Nonexempt Charitable Trust  
Treated as a Private Foundation**

**2009**

Department of the Treasury  
Internal Revenue Service

**Note:** The foundation may be able to use a copy of this return to satisfy state reporting requirements

**For calendar year 2009, or tax year beginning** \_\_\_\_\_, **2009, and ending** \_\_\_\_\_, **20**

**G** Check all that apply.  Initial return  Initial return of a former public charity  Final return  
 Amended return  Address change  Name change

<b>Use the IRS label. Otherwise, print or type. See Specific Instructions.</b>	Name of foundation <b>FUSION POWER ASSOCIATES</b>	<b>A Employer identification number</b> 52-1162794
	Number and street (or P.O. box number if mail is not delivered to street address) Room/suite <b>2 PROFESSIONAL DRIVE 249</b>	<b>B Telephone number (see instructions)</b> (301) 258-0545
	City or town, state, and ZIP code <b>Gaithersburg MD 20879</b>	<b>C</b> If exempt application is pending, check here <input type="checkbox"/> <b>D 1.</b> Foreign organizations, check here <input type="checkbox"/> <b>2.</b> Foreign organizations meeting the 85% test, check here and attach computation <input type="checkbox"/> <b>E</b> If private foundation status was terminated under section 507(b)(1)(A), check here <input type="checkbox"/> <b>F</b> If the foundation is in a 60-month termination under section 507(b)(1)(B), check here <input type="checkbox"/>
<b>H</b> Check type of organization: <input checked="" type="checkbox"/> Section 501(c)(3) exempt private foundation <input type="checkbox"/> Section 4947(a)(1) nonexempt charitable trust <input type="checkbox"/> Other taxable private foundation		
<b>I</b> Fair market value of all assets at end of year (from Part II, col. (c), line 16) \$ <b>444,381</b>	<b>J</b> Accounting method: <input type="checkbox"/> Cash <input checked="" type="checkbox"/> Accrual <input type="checkbox"/> Other (specify) _____ (Part I, column (d) must be on cash basis)	

	(a) Revenue and expenses per books	(b) Net investment income	(c) Adjusted net income	(d) Disbursements for charitable purposes (cash basis only)
<b>Part I Analysis of Revenue and Expenses</b> (The total of amounts in columns (b), (c), & (d) may not necessarily equal the amounts in column (a) (see instructions).)				
<b>1</b> Contributions, gifts, grants, etc., received (attach schedule) . . . . .	25,287			
<b>2</b> Check <input type="checkbox"/> if the foundation is <b>not</b> required to attach Sch. B				
<b>3</b> Interest on savings and temp. cash investments	510	510	510	
<b>4</b> Dividends and interest from securities	1,365	1,365	1,365	
<b>5 a</b> Gross rents . . . . .				
<b>b</b> Net rental income or (loss) _____				
<b>6 a</b> Net gain/(loss) from sale of assets not on line 10				
<b>b</b> Gross sales price for all assets on line 6a _____				
<b>7</b> Capital gain net income (from Part IV, line 2) . . . . .		0		
<b>8</b> Net short-term capital gain . . . . .			0	
<b>9</b> Income modifications . . . . .			0	
<b>10 a</b> Gross sales less rtns. & allowances _____	0			
<b>b</b> Less Cost of goods sold . . . . .				
<b>c</b> Gross profit or (loss) (attach schedule)				
<b>11</b> Other income (attach schedule) . #1	112,214			
<b>12 Total.</b> Add lines 1 through 11 . . . . .	139,376	1,875	1,875	
<b>13</b> Compensation of officers, directors, trustees, etc. . . . .	54,290	292		53,998
<b>14</b> Other employee salaries and wages . . . . .				
<b>15</b> Pension plans, employee benefits . . . . .				
<b>16 a</b> Legal fees (attach schedule) . . . . .				
<b>b</b> Accounting fees (attach schedule) #2	900	9		891
<b>c</b> Other professional fees (attach schedule)				
<b>17</b> Interest . . . . .				
<b>18</b> Taxes (attach schedule) (see instruction) #3	5,509	256		5,253
<b>19</b> Depreciation (attach sch.) and depletion	2,580			
<b>20</b> Occupancy . . . . .	7,427	700		6,727
<b>21</b> Travel, conferences, and meetings . . . . .	55,994			55,994
<b>22</b> Printing and publications . . . . .	116			116
<b>23</b> Other expenses (attach schedule) #4	12,277	214		12,063
<b>24 Total operating and administrative expenses.</b> Add lines 13 through 23	139,093	1,471		135,042
<b>25</b> Contributions, gifts, grants paid . . . . .				
<b>26 Total exp. &amp; disbursements.</b> Add lines 24 and 25	139,093	1,471		135,042
Subtract line 26 from line 12				
<b>a Excess of revenue over expenses and disbursements</b>	283			
<b>b Net investment income</b> (if neg., enter -0-)		404		
<b>c Adjusted net income</b> (if neg., enter -0-)			1,875	

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Part II Balance Sheets		Attached schedules and amounts in the description column should be for end-of-year amounts only (See inst.)			
		Beginning of year	End of year		
		(a) Book Value	(b) Book Value	(c) Fair Market Value	
ASSETS	1	Cash -- non-interest-bearing	23,845	34,471	34,471
	2	Savings and temporary cash investments	93,440	97,910	97,910
	3	Accounts receivable <u>11,000</u>			
		Less allowance for doubtful accts. ▶	16,700	11,000	11,000
	4	Pledges receivable ▶			
		Less allowance for doubtful accts. ▶			
	5	Grants receivable			
	6	Receivables due from officers, directors, trustees, and other disqualified persons (attach schedule) (see the instructions)			
	7	Other notes and loans receivable (attach schedule) ▶			
		Less allowance for doubtful accounts ▶			
	8	Inventories for sale or use			
	9	Prepaid expenses and deferred charges			
	10a	Investments -- U.S. and state govt. obligations (attach sch)			
	b	Investments -- corporate stock (attach schedule)			
	c	Investments -- corporate bonds (attach schedule)			
	11	Investments -- land, buildings, and equipment basis			
	Less accumulated depreciation (attach schedule) ▶				
12	Investments -- mortgage loans				
13	Investments -- other (attach schedule)				
14	Land, buildings, and equipment basis <u>169,374</u>	#5			
	Less accumulated depreciation (attach schedule) <u>98,379</u>	73,575	70,995	301,000	
15	Other assets (describe ▶)				
16	<b>Total assets</b> (to be completed by all filers -- see the instructions Also, see page 1, item I)	207,560	214,376	444,381	
LIABILITIES	17	Accounts payable and accrued expenses	3,209	2,043	
	18	Grants payable			
	19	Deferred revenue	69,858	77,557	
	20	Loans from officers, directors, trustees, and other disqualified persons			
	21	Mortgages and other notes payable (attach schedule)			
	22	Other liabilities (describe ▶)			
	23	<b>Total liabilities</b> (add lines 17 through 22)	73,067	79,600	
NET ASSETS OR FUND BALANCES	Foundations that follow SFAS 117, check here <input checked="" type="checkbox"/> and complete lines 24 through 26 and lines 30 and 31.				
	24	Unrestricted	134,493	134,776	
	25	Temporarily restricted			
	26	Permanently restricted			
	Foundations that do not follow SFAS 117, ck. here <input type="checkbox"/> and complete lines 27 through 31.				
	27	Capital stock, trust principal, or current funds			
	28	Paid-in or capital surplus, or land, bldg, and equipment fund			
	29	Retained earnings, accumulated income, endowment, or other funds	134,493	134,776	
30	<b>Total net assets or fund balances</b> (see the instructions)	134,493	134,776		
31	<b>Total liabilities and net assets/fund balances</b> (see the inst.)	207,560	214,376		

Part III Analysis of Changes in Net Assets or Fund Balances		
1	Total net assets or fund balances at beginning of year -- Part II, column (a), line 30 (must agree with end-of-year figure reported on prior year's return)	134,493
2	Enter amount from Part I, line 27a	283
3	Other increases not included in line 2 (itemize) ▶	
4	Add lines 1, 2, and 3	134,776
5	Decreases not included in line 2 (itemize) ▶	
6	<b>Total net assets or fund balances at end of year</b> (line 4 minus line 5) -- Part II, column (b), line 30.	134,776

**Part IV Capital Gains and Losses for Tax on Investment Income**

(a) List and describe the kind(s) of property sold (e.g., real estate, 2-story brick warehouse, or common stock, 200 shs. MLC Co.)		(b) How acquired P -- Purchase D -- Donation	(c) Date acquired (mo, day, yr)	(d) Date sold (mo., day, yr.)
1a				
b				
c				
d				
e				
(e) Gross sales price	(f) Depreciation allowed (or allowable)	(g) Cost or other basis plus expense of sale	(h) Gain or (loss) (e) plus (f) minus (g)	
a				
b				
c				
d				
e				
Complete only for assets showing gain in column (h) and owned by the foundation on 12/31/69			(i) Gains (Col. (h) gain minus col. (k), but not less than -0-) or Losses (from col. (h))	
(i) FMV as of 12/31/69	(j) Adjusted basis as of 12/31/69	(k) Excess of col. (i) over col. (j), if any		
a				
b				
c				
d				
e				
2 Capital gain net income or (net capital loss)	[ If gain, also enter in Part I, line 7 If (loss), enter -0- in Part I, line 7 ]		2	0
3 Net short-term capital gain or (loss) as defined in sections 1222(5) and (6): If gain, also enter in Part I, line 8, column (c) (see the instructions) ... If (loss), enter -0- in Part I, line 8	[ If gain, also enter in Part I, line 8, column (c) (see the instructions) ... If (loss), enter -0- in Part I, line 8 ]		3	0

**Part V Qualification Under Section 4940(e) for Reduced Tax on Net Investment Income**

(For optional use by domestic private foundations subject to the section 4940(a) tax on net investment income.)

If section 4940(d)(2) applies, leave this part blank.

Was the foundation liable for the section 4942 tax on the distributable amount of any year in the base period? . . . . .  Yes  No  
 If "Yes," the foundation does not qualify under section 4940(e). Do not complete this part.

1 Enter the appropriate amount in each column for each year; see the instructions before making any entries

(a) Base period years Calendar year (or tax year beg in)	(b) Adjusted qualifying distributions	(c) Net value of noncharitable-use assets	(d) Distribution ratio (col. (b) divided by col. (c))
2008			
2007			
2006			
2005			
2004			
2 Total of line 1, column (d)			2 0.000000
3 Average distribution ratio for the 5-year base period -- divide the total on line 2 by 5, or by the number of years the foundation has been in existence if less than 5 years.			3 0.000000
4 Enter the net value of noncharitable-use assets for 2009 from Part X, line 5.			4 478,546
5 Multiply line 4 by line 3			5
6 Enter 1% of net investment income (1% of Part I, line 27b)			6 4
7 Add lines 5 and 6			7 4
8 Enter qualifying distributions from Part XII, line 4.			8 135,042

If line 8 is equal to or greater than line 7, check the box in Part VI, line 1b, and complete that part using a 1% tax rate. See the Part VI instructions.

**Part VI Excise Tax Based on Investment Income (Section 4940(a), 4940(b), 4940(e), or 4948 -- see the instructions)**

<b>1 a</b> Exempt operating foundations described in section 4940(d)(2), check here <input type="checkbox"/> and enter "N/A" on line 1. Date of ruling or determination letter: _____ (attach copy of ruling letter if necessary -- see instructions)		
<b>b</b> Domestic foundations that meet the section 4940(e) requirements in Part V, check here <input checked="" type="checkbox"/> and enter 1% of Part I, line 27b . . . . .	<b>1</b>	<b>4</b>
<b>c</b> All other domestic foundations enter 2% of line 27b. Exempt foreign organizations enter 4% of Part I, line 12, col. (b)		
<b>2</b> Tax under section 511 (domestic section 4947(a)(1) trusts and taxable foundations only. Others enter -0-)	<b>2</b>	<b>0</b>
<b>3</b> Add lines 1 and 2 . . . . .	<b>3</b>	<b>4</b>
<b>4</b> Subtitle A (income) tax (domestic section 4947(a)(1) trusts and taxable foundations only. Others enter -0-)	<b>4</b>	<b>0</b>
<b>5 Tax based on investment income.</b> Subtract line 4 from line 3. If zero or less, enter -0- . . . . .	<b>5</b>	<b>4</b>
<b>6 Credits/Payments</b>		
<b>a</b> 2009 estimated tax payments and 2008 overpayment credited to 2009 . . . . .	<b>6a</b>	
<b>b</b> Exempt foreign organizations -- tax withheld at source . . . . .	<b>6b</b>	
<b>c</b> Tax paid with application for extension of time to file (Form 8868) . . . . .	<b>6c</b>	
<b>d</b> Backup withholding erroneously withheld . . . . .	<b>6d</b>	
<b>7</b> Total credits and payments. Add lines 6a through 6d . . . . .	<b>7</b>	<b>0</b>
<b>8</b> Enter any <b>penalty</b> for underpayment of estimated tax. Check here <input type="checkbox"/> if Form 2220 is attached . . . . .	<b>8</b>	
<b>9 Tax due.</b> If the total of lines 5 and 8 is more than line 7, enter <b>amount owed</b> . . . . .	<b>9</b>	<b>4</b>
<b>10 Overpayment.</b> If line 7 is more than the total of lines 5 and 8, enter the <b>amount overpaid</b> . . . . .	<b>10</b>	
<b>11</b> Enter amount of line 10 to be <b>Credited to 2010 estimated tax</b> ▶ <b>Refunded</b> ▶	<b>11</b>	

**Part VII-A Statements Regarding Activities**

	Yes	No
<b>1 a</b> During the tax year, did the foundation attempt to influence any national, state, or local legislation or did it participate or intervene in any political campaign? . . . . .		X
<b>b</b> Did it spend more than \$100 during the year (either directly or indirectly) for political purposes (see the instructions for definition)? . . . . . If the answer is "Yes" to <b>1 a</b> or <b>1 b</b> , attach a detailed description of the activities and copies of any materials published or distributed by the foundation in connection with the activities		X
<b>c</b> Did the foundation file <b>Form 1120-POL</b> for this year? . . . . .		X
<b>d</b> Enter the amount (if any) of tax on political expenditures (section 4955) imposed during the year <b>(1)</b> On the foundation ▶ \$ <u>0</u> <b>(2)</b> On foundation managers . . ▶ \$ <u>0</u>		
<b>e</b> Enter the reimbursement (if any) paid by the foundation during the year for political expenditure tax imposed on foundation managers . . ▶ \$ <u>0</u>		
<b>2</b> Has the foundation engaged in any activities that have not previously been reported to the IRS? . . . . . If "Yes," attach a detailed description of the activities		X
<b>3</b> Has the foundation made any changes, not previously reported to the IRS, in its governing instrument, articles of incorporation, or bylaws, or other similar instruments? If "Yes," attach a conformed copy of the changes . . . . .		X
<b>4 a</b> Did the foundation have unrelated business gross income of \$1,000 or more during the year? . . . . .		X
<b>b</b> If "Yes," has it filed a tax return on <b>Form 990-T</b> for this year? . . . . .	N/A	
<b>5</b> Was there a liquidation, termination, dissolution, or substantial contraction during the year? . . . . . If "Yes," attach the statement required by General Instruction T		X
<b>6</b> Are the requirements of section 508(e) (relating to sections 4941 through 4945) satisfied either ● By language in the governing instrument, or ● By state legislation that effectively amends the governing instrument so that no mandatory directions that conflict with the state law remain in the governing instrument? . . . . .	X	
<b>7</b> Did the foundation have at least \$5,000 in assets at any time during the yr? If "Yes," complete Part II, col. (c), & Part XV	X	
<b>8 a</b> Enter the states to which the foundation reports or with which it is registered (see the instructions) ▶ CA		
<b>b</b> If the answer is "Yes" to line 7, has the foundation furnished a copy of Form 990-PF to the Attorney General (or designate) of each state as required by General Instruction G? If "No," attach explanation . . . . .	X	
<b>9</b> Is the foundation claiming status as a private operating foundation within the meaning of section 4942(j)(3) or 4942(j)(5) for calendar year 2009 or the taxable year beginning in 2009 (see instructions for Part XIV)? If "Yes," complete Part XIV . . . . .	X	
<b>10</b> Did any persons become substantial contributors during tax year? If "Yes," attach a schedule listing their names and addresses . . . . .		X

Part VII-A Statements Regarding Activities (continued)

Table with 3 columns: Question number, Question text, and Yes/No columns. Rows include questions 11-15 regarding controlled entities, insurance contracts, public inspection requirements, website address, and nonexempt charitable trusts.

Part VII-B Statements Regarding Activities for Which Form 4720 May Be Required

File Form 4720 if any item is checked in the "Yes" column, unless an exception applies.

Table with 3 columns: Question number, Question text, and Yes/No columns. Rows include questions 1a-1c, 2a-2c, 3a-3b, and 4a-4b regarding disqualifying activities, taxes on failure to distribute income, and excess business holdings.

**Part VII-B Statements Regarding Activities for Which Form 4720 May Be Required** (continued)

**5a** During the year did the foundation pay or incur any amount to:

(1) Carry on propaganda, or otherwise attempt to influence legislation (section 4945(e))?  Yes  No

(2) Influence the outcome of any specific public election (see section 4955), or to carry on, directly or indirectly, any voter registration drive?  Yes  No

(3) Provide a grant to an individual for travel, study, or other similar purposes?  Yes  No

(4) Provide a grant to an organization other than a charitable, etc., organization described in section 509(a)(1), (2), or (3), or section 4940(d)(2)? (see instructions)  Yes  No

(5) Provide for any purpose other than religious, charitable, scientific, literary, or educational purposes, or for the prevention of cruelty to children or animals?  Yes  No

**b** If any answer is "Yes" to 5a(1)-(5), did any of the transactions fail to qualify under the exceptions described in Regulations section 53.4945 or in a current notice regarding disaster assistance (see the instructions)?  Yes  No  
 Organizations relying on a current notice regarding disaster assistance check here

**c** If the answer is "Yes" to question 5a(4), does the foundation claim exemption from the tax because it maintained expenditure responsibility for the grant?  Yes  No  
 If "Yes," attach the statement required by Regulations section 53.4945-5(d) *N/A*

**6a** Did the foundation, during the year, receive any funds, directly or indirectly, to pay premiums on a personal benefit contract?  Yes  No

**b** Did the foundation, during the year, pay premiums, directly or indirectly, on a personal benefit contract?  Yes  No  
 If "Yes" to 6b, file Form 8870.

**7a** At any time during the tax year, was the foundation a party to a prohibited tax shelter transaction?  Yes  No

**b** If yes, did the foundation receive any proceeds or have any net income attributable to the transaction?  Yes  No

**Part VIII Information About Officers, Directors, Trustees, Foundation Managers, Highly Paid Employees, and Contractors**

**1 List all officers, directors, trustees, foundation managers and their compensation (see the instructions).**

(a) Name and address	(b) Title, and avg hours per week devoted to position	(c) Compensation (If not paid, enter -0-)	(d) Contributions to employee benefit plans and deferred comp	(e) Expense account, other allowances
See attachment #7				

**2 Compensation of five highest-paid employees (other than those included on line 1 -- see the instructions). If none, enter "NONE."**

(a) Name and address of each employee paid more than \$50,000	(b) Title, and avg hours per week devoted to position	(c) Compensation	(d) Contributions to employee benefit plans and deferred compensation	(e) Expense account, other allowances
NONE				

Total number of other employees paid over \$50,000  0

**Part VIII Information About Officers, Directors, Trustees, Foundation Managers, Highly Paid Employees, and Contractors** (continued)

**3 Five highest-paid independent contractors for professional services (see the instructions). If none, enter "NONE."**

(a) Name and address of each person paid more than \$50,000	(b) Type of service	(c) Compensation
NONE		

Total number of others receiving over \$50,000 for professional services . . . . . ▶

**Part IX-A Summary of Direct Charitable Activities**

List the foundation's four largest direct charitable activities during the tax year. Include relevant statistical information such as the number of organizations and other beneficiaries served, conferences convened, research papers produced, etc	Expenses
1 See attachment #8	19,542
2 See attachment #9	10,870
3 See attachment #10	22,755
4 See attachment #11	8,772

**Part IX-B Summary of Program-Related Investments** (see the instructions)

Describe the two largest program-related investments made by the foundation during the tax year on lines 1 and 2	Amount
1	
2	
All other program-related investments. See the instructions	

**Total.** Add lines 1 through 3 . . . . . ▶

**Part X Minimum Investment Return** (All domestic foundations must complete this part. Foreign foundations, see the instructions.)

<b>1</b>	Fair market value of assets not used (or held for use) directly in carrying out charitable, etc., purposes		
<b>a</b>	Average monthly fair market value of securities	<b>1a</b>	95,675
<b>b</b>	Average of monthly cash balances	<b>1b</b>	29,158
<b>c</b>	Fair market value of all other assets (see the instructions)	<b>1c</b>	361,000
<b>d</b>	<b>Total</b> (add lines 1a, b, and c)	<b>1d</b>	485,833
<b>e</b>	Reduction claimed for blockage or other factors reported on lines 1a and 1c (attach detailed explanation)	<b>1e</b>	
<b>2</b>	Acquisition indebtedness applicable to line 1 assets	<b>2</b>	
<b>3</b>	Subtract line 2 from line 1d	<b>3</b>	485,833
<b>4</b>	Cash deemed held for charitable activities. Enter 1 1/2 % of line 3 (for greater amount, see the instructions)	<b>4</b>	7,287
<b>5</b>	<b>Net value of noncharitable-use assets.</b> Subtract line 4 from line 3. Enter here and on Part V, line 4	<b>5</b>	478,546
<b>6</b>	<b>Minimum investment return.</b> Enter 5% of line 5	<b>6</b>	23,927

**Part XI Distributable Amount** (see the instructions) (Section 4942(j)(3) and (j)(5) private operating foundations and certain foreign organizations check here  and do not complete this part.)

<b>1</b>	Minimum investment return from Part X, line 6	<b>1</b>	23,927
<b>2a</b>	Tax on investment income for 2009 from Part VI, line 5	<b>2a</b>	4
<b>b</b>	Income tax for 2009. (This does not include the tax from Part VI.)	<b>2b</b>	
<b>c</b>	Add lines 2a and 2b	<b>2c</b>	4
<b>3</b>	Distributable amount before adjustments. Subtract line 2c from line 1	<b>3</b>	23,923
<b>4</b>	Recoveries of amounts treated as qualifying distributions	<b>4</b>	
<b>5</b>	Add lines 3 and 4	<b>5</b>	23,923
<b>6</b>	Deduction from distributable amount (see the instructions)	<b>6</b>	
<b>7</b>	<b>Distributable amount as adjusted.</b> Subtract line 6 from line 5. Enter here and on Part XIII, line 1	<b>7</b>	23,923

**Part XII Qualifying Distributions** (see the instructions)

<b>1</b>	Amounts paid (including administrative expenses) to accomplish charitable, etc., purposes:		
<b>a</b>	Expenses, contributions, gifts, etc -- total from Part I, column (d), line 26	<b>1a</b>	135,042
<b>b</b>	Program-related investments -- total from Part IX-B	<b>1b</b>	
<b>2</b>	Amounts paid to acquire assets used (or held for use) directly in carrying out charitable, etc., purposes	<b>2</b>	
<b>3</b>	Amounts set aside for specific charitable projects that satisfy the:		
<b>a</b>	Suitability test (prior IRS approval required)	<b>3a</b>	
<b>b</b>	Cash distribution test (attach the required schedule)	<b>3b</b>	
<b>4</b>	<b>Qualifying distributions.</b> Add lines 1a through 3b. Enter here and on Part V, line 8, and Part XIII, line 4	<b>4</b>	135,042
<b>5</b>	Foundations that qualify under section 4940(e) for the reduced rate of tax on net investment income. Enter 1% of Part I, line 27b (see the instructions)	<b>5</b>	4
<b>6</b>	<b>Adjusted qualifying distributions.</b> Subtract line 5 from line 4	<b>6</b>	135,038

**Note:** The amount on line 6 will be used in Part V, column (b), in subsequent years when calculating whether the foundation qualifies for the section 4940(e) reduction of tax in those years.

**Part XIII Undistributed Income** (see the instructions)

	(a) Corpus	(b) Years prior to 2008	(c) 2008	(d) 2009
<b>1</b> Distributable amount for 2009 from Part XI, line 7 . . . . .				23,923
<b>2</b> Undistributed income, if any, as of the end of 2009				
<b>a</b> Enter amount for 2008 only . . . . .			19,132	
<b>b</b> Total for prior years 20 <u>07</u> , 20 <u>06</u> , 20 <u>05</u> . . . . .		86,375		
<b>3</b> Excess distributions carryover, if any, to 2009				
<b>a</b> From 2004 . . . . .				
<b>b</b> From 2005 . . . . .				
<b>c</b> From 2006 . . . . .				
<b>d</b> From 2007 . . . . .				
<b>e</b> From 2008 . . . . .				
<b>f</b> Total of lines 3a through e . . . . .	0			
<b>4</b> Qualifying distributions for 2009 from Part XII, line 4 ▶ \$ <u>135,042</u>				
<b>a</b> Applied to 2008, but not more than line 2a . . . . .				
<b>b</b> Applied to undistributed income of prior years (Election required -- see the instructions) . . . . .				
<b>c</b> Treated as distributions out of corpus (Election required -- see the instructions) . . . . .				
<b>d</b> Applied to 2009 distributable amount . . . . .				
<b>e</b> Remaining amount distributed out of corpus . . . . .				
<b>5</b> Excess distributions carryover applied to 2009 . . . . . (If an amount appears in column (d), the same amount must be shown in column (a) )				
<b>6</b> Enter the net total of each column as indicated below:				
<b>a</b> Corpus. Add lines 3f, 4c, and 4e. Subtract line 5 . . . . .				
<b>b</b> Prior years' undistributed income. Subtract line 4b from line 2b . . . . .		86,375		
<b>c</b> Enter the amount of prior years' undistributed income for which a notice of deficiency has been issued, or on which the section 4942(a) tax has been previously assessed . . . . .				
<b>d</b> Subtract line 6c from line 6b. Taxable amount -- see the instructions . . . . .		86,375		
<b>e</b> Undistributed income for 2008. Subtract line 4a from line 2a. Taxable amount -- see the instructions . . . . .			19,132	
<b>f</b> Undistributed income for 2009. Subtract lines 4d and 5 from line 1. This amount must be distributed in 2010 . . . . .				23,923
<b>7</b> Amounts treated as distributions out of corpus to satisfy requirements imposed by section 170(b)(1)(F) or 4942(g)(3) (see the instructions) . . . . .				
<b>8</b> Excess distributions carryover from 2004 not applied on line 5 or line 7 (see the instructions) . . . . .				
<b>9</b> Excess distributions carryover to 2010. Subtract lines 7 and 8 from line 6a . . . . .				
<b>10</b> Analysis of line 9:				
<b>a</b> Excess from 2005 . . . . .				
<b>b</b> Excess from 2006 . . . . .				
<b>c</b> Excess from 2007 . . . . .				
<b>d</b> Excess from 2008 . . . . .				
<b>e</b> Excess from 2009 . . . . .				

**Part XIV Private Operating Foundations** (see instructions and Part VII-A, question 9)

<p><b>1a</b> If the foundation has received a ruling or determination letter that it is a private operating foundation, and the ruling is effective for 2009, enter the date of the ruling. <span style="float: right;">▶</span></p>					
<p><b>b</b> Check box to indicate whether the foundation is a private operating foundation described in section <input checked="" type="checkbox"/> 4942(j)(3) or <input type="checkbox"/> 4942(j)(5)</p>					
<p><b>2a</b> Enter the lesser of the adjusted net income from Part I or the minimum investment return from Part X for each year listed</p>	<p>Tax year</p>			<p>Prior 3 years</p>	<p>(e) Total</p>
	(a) 2009	(b) 2008	(c) 2007	(d) 2006	
	1,875	3,704	4,198	6,366	16,143
<p><b>b</b> 85% of line 2a</p>	1,594	3,148	3,568	5,411	13,722
<p><b>c</b> Qualifying distributions from Part XII, line 4 for each year listed</p>	135,042	135,471	123,366	132,588	526,467
<p><b>d</b> Amounts included in line 2c not used directly for active conduct exempt act</p>					0
<p><b>e</b> Qualifying distributions made directly for active conduct of exempt activities Subtract line 2d from line 2c</p>	135,042	135,471	123,366	132,588	526,467
<p><b>3</b> Complete 3a, b, or c for the alternative test relied upon:</p>					
<p><b>a</b> "Assets" alternative test -- enter</p>					
<p>(1) Value of all assets</p>	444,381	379,885	392,539	356,893	1,573,698
<p>(2) Value of assets qualifying under section 4942(j)(3)(B)(i)</p>	444,381	379,885	392,539	356,893	1,573,698
<p><b>b</b> "Endowment" alternative test -- enter 2/3 of min investment return shown in Part X, line 6 for each year listed</p>					
	23,927	19,179	19,470	11,505	74,081
<p><b>c</b> "Support" alternative test -- enter</p>					
<p>(1) Total support other than gross investment income (interest, dividends, rents, payments on securities loans (section 512(a)(5)), or royalties)</p>					0
<p>(2) Support from general public and 5 or more exempt organizations as provided in section 4942(j)(3)(B)(iii)</p>					0
<p>(3) Largest amount of support from an exempt organization</p>					0
<p>(4) Gross investment income</p>					0

**Part XV Supplementary Information (Complete this part only if the foundation had \$5,000 or more in assets at any time during the year -- see the instructions.)**

**1 Information Regarding Foundation Managers:**

**a** List any managers of the foundation who have contributed more than 2% of the total contributions received by the foundation before the close of any tax year (but only if they have contributed more than \$5,000). (See section 507(d)(2).)  
None

**b** List any managers of the foundation who own 10% or more of the stock of a corporation (or an equally large portion of the ownership of a partnership or other entity) of which the foundation has a 10% or greater interest.  
None

**2 Information Regarding Contribution, Grant, Gift, Loan, Scholarship, etc., Programs:**  
Check here  if the foundation only makes contributions to preselected charitable organizations and does not accept unsolicited requests for funds. If the foundation makes gifts, grants, etc. (see the instructions) to individuals or organizations under other conditions, complete items 2a, b, c, and d

**a** The name, address, and telephone number of the person to whom applications should be addressed:

**b** The form in which applications should be submitted and information and materials they should include:

**c** Any submission deadlines:

**d** Any restrictions or limitations on awards, such as by geographical areas, charitable fields, kinds of institutions, or other factors:

**Part XV** Supplementary Information (continued)

**3 Grants and Contributions Paid During the Year or Approved for Future Payment**

Recipient	If recipient is an individual, show any relationship to any foundation manager or substantial contributor	Foundation status of recipient	Purpose of grant or contribution	Amount
Name and address (home or business)				
<b>a</b> Paid during the year				
<b>Total</b> .....				▶ <b>3a</b> 0
<b>b</b> Approved for future payment				
<b>Total</b> .....				▶ <b>3b</b>

**Part XVI-A Analysis of Income-Producing Activities**

Enter gross amounts unless otherwise indicated

	Unrelated business income		Excluded by section 512, 513, or 514		(e) Related or exempt function income (See the instructions.)
	(a) Business code	(b) Amount	(c) Excl code	(d) Amount	
1 Program service revenue:					
a See attachment #12					25,587
b					
c					
d					
e					
f					
g Fees & contracts from government agencies					
2 Membership dues and assessments					46,560
3 Interest on savings and temporary cash investments					510
4 Dividends and interest from securities					1,365
5 Net rental income or (loss) from real estate					
a Debt-financed property					
b Not debt-financed property					
6 Net rental income or (loss) from personal property					
7 Other investment income					
8 Gain or (loss) from sales of assets other than inventory					
9 Net income or (loss) from special events					
10 Gross profit or (loss) from sales of inventory					
11 Other revenue					
a					
b See attachment #13					65,354
c					
d					
e					
12 Subtotal Add columns (b), (d), and (e)		0		0	139,376
13 Total. Add line 12, columns (b), (d), and (e)					139,376

(See worksheet in line 13 instructions to verify calculations.)

**Part XVI-B Relationship of Activities to the Accomplishment of Exempt Purposes**

Line No. ▼	Explain below how each activity for which income is reported in column (e) of Part XVI-A contributed importantly to the accomplishment of the foundation's exempt purposes (other than by providing funds for such purposes). (See the instructions.)
	See attachment #14

**Part XVII Information Regarding Transfers To and Transactions and Relationships With Noncharitable Exempt Organizations**

<b>1</b>	Did the organization directly or indirectly engage in any of the following with any other organization described in section 501(c) of the Code (other than section 501(c)(3) organizations) or in section 527, relating to political organizations?		<b>Yes</b>	<b>No</b>
<b>a</b>	Transfers from the reporting foundation to a noncharitable exempt organization of:			
	(1) Cash .....	<b>1a(1)</b>		X
	(2) Other assets .....	<b>1a(2)</b>		X
<b>b</b>	Other transactions:			
	(1) Sales of assets to a noncharitable exempt organization .....	<b>1b(1)</b>		X
	(2) Purchases of assets from a noncharitable exempt organization .....	<b>1b(2)</b>		X
	(3) Rental of facilities, equipment, or other assets .....	<b>1b(3)</b>		X
	(4) Reimbursement arrangements .....	<b>1b(4)</b>		X
	(5) Loans or loan guarantees .....	<b>1b(5)</b>		X
	(6) Performance of services or membership or fundraising solicitations .....	<b>1b(6)</b>		X
<b>c</b>	Sharing of facilities, equipment, mailing lists, other assets, or paid employees .....	<b>1c</b>		X
<b>d</b>	If the answer to any of the above is "Yes," complete the following schedule. Column (b) should always show the fair market value of the goods, other assets, or services given by the reporting foundation. If the foundation received less than fair market value in any transaction or sharing arrangement, show in column (d) the value of the goods, other assets, or services received.			


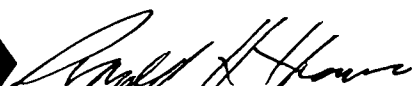
(a) Line no.	(b) Amount involved	(c) Name of noncharitable exempt organization	(d) Description of transfers, transactions, and sharing arrangements

**2 a** Is the foundation directly or indirectly affiliated with, or related to, one or more tax-exempt organizations described in section 501(c) of the Code (other than section 501(c)(3)) or in section 527? .....  Yes  No

**b** If "Yes," complete the following schedule

(a) Name of organization	(b) Type of organization	(c) Description of relationship

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than taxpayer or fiduciary) is based on all information of which preparer has any knowledge.

<b>S I G N  H E R E</b>			05-10-10	PRESIDENT	
	Signature of officer or trustee		Date	Title	
	Paid Preparer's Use Only	Preparer's signature 	Date 5-4-10	Check if self-employed <input checked="" type="checkbox"/>	Preparer's identifying number (see Signature in the instructions)
	Firm's name (or yours if self-employed), address, and ZIP code RONALD H THOMAS CPA 11301 SPUR WHEEL LANE POTOMAC, MD 20854-1203		EIN ▶ 52-0880202	Phone no (301) 983-0330	

**Schedule B**(Form 990, 990-EZ,  
or 990-PF)Department of the Treasury  
Internal Revenue Service**Schedule of Contributors**

▶ Attach to Form 990, 990-EZ, or 990-PF.

OMB No 1545-0047

**2009****Name of the organization****Employer identification number**

FUSION POWER ASSOCIATES

52-1162794

**Organization type** (check one).**Filers of:****Section:**

Form 990 or 990-EZ

 501(c)( ) (enter number) organization 4947(a)(1) nonexempt charitable trust **not** treated as a private foundation 527 political organization

Form 990-PF

 501(c)(3) exempt private foundation 4947(a)(1) nonexempt charitable trust treated as a private foundation 501(c)(3) taxable private foundationCheck if your organization is covered by the **General Rule** or a **Special Rule**.**Note.** Only a section 501(c)(7), (8), or (10) organization can check boxes for both the General Rule and a Special Rule. See instructions.**General Rule**

- 
- For an organization filing Form 990, 990-EZ, or 990-PF that received, during the year, \$5,000 or more (in money or property) from any one contributor. Complete Parts I and II.

**Special Rules**

- For a section 501(c)(3) organization filing Form 990 or 990-EZ that met the 33 1/3% support test of the regulations under sections 509(a)(1) and 170(b)(1)(A)(vi), and received from any one contributor, during the year, a contribution of the greater of (1) \$5,000 or (2) 2% of the amount on (i) Form 990, Part VIII, line 1h or (ii) Form 990-EZ, line 1. Complete Parts I and II.
- For a section 501(c)(7), (8), or (10) organization filing Form 990 or 990-EZ that received from any one contributor, during the year, aggregate contributions of more than \$1,000 for use exclusively for religious, charitable, scientific, literary, or educational purposes, or the prevention of cruelty to children or animals. Complete Parts I, II, and III.
- For a section 501(c)(7), (8), or (10) organization filing Form 990 or 990-EZ that received from any one contributor, during the year, contributions for use exclusively for religious, charitable, etc., purposes, but these contributions did not aggregate to more than \$1,000. If this box is checked, enter here the total contributions that were received during the year for an exclusively religious, charitable, etc., purpose. Do not complete any of the parts unless the **General Rule** applies to this organization because it received nonexclusively religious, charitable, etc., contributions of \$5,000 or more during the year. ▶ \$ \_\_\_\_\_

**Caution.** An organization that is not covered by the General Rule and/or the Special Rules does not file Schedule B (Form 990, 990-EZ, or 990-PF), but it **must** answer "No" on Part IV, line 2 of its Form 990, or check the box on line H of its Form 990-EZ, or on line 2 of its Form 990-PF, to certify that it does not meet the filing requirements of Schedule B (Form 990, 990-EZ, or 990-PF).**For Privacy Act and Paperwork Reduction Act Notice, see the Instructions for Form 990, 990-EZ, or 990-PF.****Schedule B (Form 990, 990-EZ, or 990-PF) (2009)**

<b>Name of organization</b> FUSION POWER ASSOCIATES	<b>Employer identification number</b> 52-1162794
--	---

**Part I Contributors** (see instructions)

(a) No.	(b) Name, address, and ZIP + 4	(c) Aggregate contributions	(d) Type of contribution
1	IEEE 445 HOES LANE PISCATAWAY, NJ 08855	\$ 5,000	Person <input checked="" type="checkbox"/> Payroll <input type="checkbox"/> Noncash <input type="checkbox"/> (Complete Part II if there is a noncash contribution )
2	AMERICAN PHYSICAL SOCIETY ONE PHYSICS ELLIPSE COLLEGE PARK, MD 20740	\$ 5,000	Person <input checked="" type="checkbox"/> Payroll <input type="checkbox"/> Noncash <input type="checkbox"/> (Complete Part II if there is a noncash contribution.)
3	LAWERENCE BERKLEY NTL LAB ONE CYCLOTION RD BERKLEY, CA 94720	\$ 10,899	Person <input checked="" type="checkbox"/> Payroll <input type="checkbox"/> Noncash <input type="checkbox"/> (Complete Part II if there is a noncash contribution )
—	_____	\$ _____	Person <input type="checkbox"/> Payroll <input type="checkbox"/> Noncash <input type="checkbox"/> (Complete Part II if there is a noncash contribution.)
—	_____	\$ _____	Person <input type="checkbox"/> Payroll <input type="checkbox"/> Noncash <input type="checkbox"/> (Complete Part II if there is a noncash contribution )
—	_____	\$ _____	Person <input type="checkbox"/> Payroll <input type="checkbox"/> Noncash <input type="checkbox"/> (Complete Part II if there is a noncash contribution )

**SCHEDULE OF OTHER INCOME**

Attachment 1: page 1 - 990-PF Page 1, Part I, Line 11

Open to Public Inspection	For calendar year 2009, or tax period beginning _____, and ending _____
Name of Organization FUSION POWER ASSOCIATES	Employer Identification Number 52-1162794

Description of Other Income	Revenue and Expenses	Net Investment Income	Adjusted Net Income
MEETINGS & SEMINARS	54,777		
SUBSCRIPTIONS	7,980		
OTHER	301		
DUES	46,560		
UNREALIZED GAINS	2,596		
<b>Totals</b>	<b>112,214</b>		

## SCHEDULE OF ACCOUNTING FEES

Attachment 2: page 1 - 990-PF Page 1, Part I, Line 16b

Open to Public Inspection	For calendar year 2009, or tax period beginning _____, and ending _____
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Name of Organization <b>FUSION POWER ASSOCIATES</b>	Employer Identification Number <b>52-1162794</b>
--	---

Accounting Category	Amount	Net Investment Income	Adjusted Net Income	Disbursements for Charity
ACCOUNTING FEES	900	9		891
Total	900	9		891

## SCHEDULE OF TAXES PAID

Attachment 3: page 1 - 990- PF Page 1, Part I, Line 18

Open to Public Inspection	For calendar year 2009, or tax period beginning _____, and ending _____
Name of Organization FUSION POWER ASSOCIATES	Employer Identification Number 52-1162794

Category	Amount	Net Investment Income	Adjusted Net Income	Disbursements for Charity
TAXES - OTHER	359	10		349
REAL ESTATE TAXES	4,577	229		4,348
PAYROLL TAXES	573	17		556
Total	5,509	256		5,253

## OTHER EXPENSES SCHEDULE

Attachment 4: page 1 990-PF Page 1, Part I, Line 23

Open to Public Inspection	For calendar year 2009, or tax period beginning	, and ending
---------------------------	---	--------------

Name of Organization <b>FUSION POWER ASSOCIATES</b>	Employer Identification Number <b>52-1162794</b>
--	---

Description of Activity	Revenue and Expenses	Net Investment Income	Adjusted Net Income	Disbursements for Charity
FUSION ENGINEERING AWARD	1,000			1,000
SUPPLIES AND SERVICES	3,546			3,546
TELEPHONE	3,407	35		3,372
POSTAGE AND DELIVERY	760	7		753
BOOKS AND SUBSCRIPTIONS	1,324			1,324
BANK SERVICE CHARGES	1,728	172		1,556
MISCELLANEOUS	512			512
<b>Total</b>	<b>12,277</b>	<b>214</b>		<b>12,063</b>

**SCHEDULE OF LAND, BUILDING & EQUIPMENT**

Attachment 5: page 1 - 990-PF Page 2, Part II, Line 14

Open to Public  
Inspection

For Calendar year 2009, or tax year period beginning

and ending

Name of Organization

FUSION POWER ASSOCIATES

Employer Identification Number

52-1162794

Category or Description of Property	Cost or Other Basis	Accumulated Depreciation	End of Year Book Value	Ending FML (990-PF Only)
CONDO FURNITURE	134,205 36,169	63,211 36,169	70,994	
Total	170,374	99,380	70,994	

BOOKS ARE IN CARE OF

Attachment 6 - 990-PF Page 5, Part VII-A, Line 14

Open to Public Inspection For calendar year 2009, or tax period beginning , and ending

Name of Organization FUSION POWER ASSOCIATES Employer Identification Number 52-1162794

Part VII-A - Line 14

Individual Name RUTH WATKINS

or Business Name

Street Address 2 PROFESSIONAL DR #249

U.S. Address.

Zip code 20879 City GAITHERSBURG State MD

Foreign Address

City

Province or State

Country

Postal code

Phone Number (301) 258-0545

Fax Number

## CURRENT OFFICERS, DIRECTORS, TRUSTEES, AND KEY EMPLOYEES

Attachment 7: page 1 - 990-PF Page 6, Part VIII

Open to Public Inspection	For calendar year 2009, or tax period beginning , and ending			
Name of Organization				Employer Identification Number
FUSION POWER ASSOCIATES				52-1162794
(A) Name and Address	(B) Title and Average Hrs. per Week	(C) Compensation (If not paid, enter 0)	(D) Cont to Employee Ben. Plans & Def Comp	(E) Expense Account & Other Allowances
STEPHEN O DEAN 2 PROFESSIONAL DR #249 Gaithersburg, MD 20879	PRESIDENT 20.00	46,800	0	0
RUTH WATKINS 2 PROFESSIONAL DR #249 Gaithersburg, MD 20879	VICE PRES 7.00	7,490	0	0
LIST ATTACHED  USA,	DIRECTORS 1.00	0	0	0

# SUMMARY OF DIRECT CHARITABLE ACTIVITIES

Attachment 8: page 1 - 990-PF Page 7, Part IX-A, Line 1

Open to Public Inspection	For calendar year 2009, or tax period beginning	, and ending
Name of Organization	Employer Identification Number	
FUSION POWER ASSOCIATES	52-1162794	

Charitable Activity

ANNUAL SIMPOSIUM: RECOGNISED THE LEADERS IN FUSION SCIENCE. GAVE AWARDS FOR SPECIAL ACHIVEMENTS

## SUMMARY OF DIRECT CHARITABLE ACTIVITIES

Attachment 9: page 1 - 990-PF Page 7, Part IX-A, Line 2

Open to Public Inspection	For calendar year 2009, or tax period beginning	, and ending
<b>Name of Organization</b> FUSION POWER ASSOCIATES		<b>Employer Identification Number</b> 52-1162794

Charitable Activity

CONFERENCE FOR PLASMA SCIENCE: DISCUSSIONS AND EXCHANGE OF INFORMATION FOR THOSE INVOLVED IN PLASMA SCIENCE.

# SUMMARY OF DIRECT CHARITABLE ACTIVITIES

Attachment 10: page 1 - 990-PF Page 7, Part IX-A, Line 3

Open to Public Inspection	For calendar year 2009, or tax period beginning	, and ending
Name of Organization	Employer Identification Number	
FUSION POWER ASSOCIATES	52-1162794	

Charitable Activity

HELD MEETING ON RETROVIRUS: DISEMINATE INFORMATION AND EXCHANGE IDEAS.

# SUMMARY OF DIRECT CHARITABLE ACTIVITIES

Attachment 11: page 1 - 990-PF Page 7, Part IX-A, Line 4

Open to Public Inspection	For calendar year 2009, or tax period beginning	, and ending
Name of Organization	Employer Identification Number	
FUSION POWER ASSOCIATES	52-1162794	

Charitable Activity

PUBLISH BI-MONTHLY NEWS LETTER: KEEP THOSE INTERESTED IN CHANGES  
ADVANCEMENTS IN FUSION

**PART VII - ANALYSIS OF INCOME-PRODUCING ACTIVITIES**

Attachment 12: page 1 - 990-PF Page 12, Part XVI-A, Line 1

Open to Public Inspection	For calendar year 2009, or tax period beginning _____, and ending _____
Name of Organization <b>FUSION POWER ASSOCIATES</b>	
Employer Identification Number <b>52-1162794</b>	

Item	Program Service Revenue	Unrelated business income		Excluded by section 512, 513 or 514		(e) Related or exempt function income (see instructions)
		(a) business code	(b) Amount	(c) Excl code	(d) Amount	
a	GRANTS					23,367
b	DONATIONS					2,220
<b>Totals</b>						<b>25,587</b>



**SCHEDULE OF RELATIONSHIP OF ACTIVITIES  
TO THE ACCOMPLISHMENT OF EXEMPT PURPOSES**

Attachment 14: page 1 990-PF Page 12, Part XVI-B

Open to Public Inspection	For calendar year 2009, or tax period beginning	, and ending
Name of Organization FUSION POWER ASSOCIATES		Employer Identification Number 52-1162794

Line Number	Briefly describe how the activity reported in column (E) of Part VII specifically contributed to the accomplishment of the organization's exempt purposes (other than by providing funds for such purposes)
1	GRANTS TO SPONSOR CONFERENCES, FORUMS, RESEARCH, ANALYSIS AND OTHER RESEARCH.
1	RESEARCH & STUDIES TO ASSESS THE TECHNOLOGICAL ADVANCES OF FUSION.
2	MEMBERSHIPS /SUBSCRIPTIONS ARE OFFERED TO PROVIDE INFORMATION TO THE PUBLIC REGARDING FUSION SCIENCE.
2	REGARDING FUSION SCIENCE.
3.-4	INTEREST & DIVIDENDS
11	MEETINGS & SEMINARS ARE HELD TO DISCUSS THE STATUS OF FUSION SCIENCE
11	MISCELLANEOUS INCOME IS GENERATED FROM SALE OF EDUCATIONAL MATERIAL RELATED TO FUSION SCIENCE
11	RELATED TO FUSION SCIENCE

## Depreciation and Amortization (Including Information on Listed Property)

Department of the Treasury  
Internal Revenue Service (99)

▶ See separate instructions.

▶ Attach to your tax return.

**2009**

Attachment  
Sequence No **67**

Name(s) shown on return <b>FUSION POWER ASSOCIATES</b>	Business or activity to which this form relates <b>FOR FORM 990-PF</b>	Identifying number <b>52-1162794</b>
---	---	---

**Part I Election To Expense Certain Property Under Section 179**

Note: If you have any listed property, complete Part V before you complete Part I.

1 Maximum amount See the instructions for a higher limit for certain businesses . . . . .	<b>1</b>	\$250,000
2 Total cost of section 179 property placed in service (see instructions) . . . . .	<b>2</b>	
3 Threshold cost of section 179 property before reduction in limitation (see instructions) . . . . .	<b>3</b>	\$800,000
4 Reduction in limitation Subtract line 3 from line 2. If zero or less, enter -0- . . . . .	<b>4</b>	
5 Dollar limitation for tax year Subtract line 4 from line 1. If zero or less, enter -0- If married filing separately, see instructions . . . . .	<b>5</b>	250,000
<b>6 (a) Description of property</b>	<b>(b) Cost (busn use only)</b>	<b>(c) Elected cost</b>
7 Listed property. Enter the amount from line 29 . . . . .	<b>7</b>	
8 Total elected cost of section 179 property. Add amounts in column (c), lines 6 and 7. . . . .	<b>8</b>	
9 Tentative deduction. Enter the smaller of line 5 or line 8 . . . . .	<b>9</b>	
10 Carryover of disallowed deduction from line 13 of your 2008 Form 4562 . . . . .	<b>10</b>	
11 Business income limitation Enter the smaller of business income (not less than zero) or line 5 (see instructions) . . . . .	<b>11</b>	250,000
12 Section 179 expense deduction. Add lines 9 and 10, but do not enter more than line 11 . . . . .	<b>12</b>	
13 Carryover of disallowed deduction to 2010 Add lines 9 and 10, less line 12. . . ▶	<b>13</b>	

Note: Do not use Part II or Part III below for listed property. Instead, use Part V.

**Part II Special Depreciation Allowance and Other Depreciation (Do not include listed property.) (See instructions.)**

14 Special depreciation allowance for qualified property (other than listed property) placed in service during the tax year (see instructions) . . . . .	<b>14</b>	
15 Property subject to section 168(f)(1) election . . . . .	<b>15</b>	
16 Other depreciation (including ACRS) . . . . .	<b>16</b>	2,580

**Part III MACRS Depreciation (Do not include listed property.) (See instructions.)**

**Section A**

17 MACRS deductions for assets placed in service in tax years beginning before 2009 . . . . .	<b>17</b>	
18 If you are electing to group any assets placed in service during the tax year into one or more general asset accounts, check here . . . . .	<input type="checkbox"/>	

**Section B -- Assets Placed in Service During 2009 Tax Year Using the General Depreciation System**

(a) Classification of property	(b) Month and year placed in service	(c) Basis for depr (business/investment use only -- see instructions)	(d) Recovery period	(e) Convention	(f) Method	(g) Depreciation deduction
<b>19a</b> 3-year property						
<b>b</b> 5-year property						
<b>c</b> 7-year property						
<b>d</b> 10-year property						
<b>e</b> 15-year property						
<b>f</b> 20-year property						
<b>g</b> 25-year property			25 yrs		S/L	
<b>h</b> Residential rental property			27.5 yrs.	MM	S/L	
			27.5 yrs.	MM	S/L	
<b>i</b> Nonresidential real property			39 yrs	MM	S/L	
				MM	S/L	

**Section C -- Assets Placed in Service During 2009 Tax Year Using the Alternative Depreciation System**

<b>20a</b> Class life					S/L	
<b>b</b> 12-year			12 yrs.		S/L	
<b>c</b> 40-year			40 yrs.	MM	S/L	

**Part IV Summary (See instructions.)**

21 Listed property. Enter amount from line 28 . . . . .	<b>21</b>	
22 Total. Add amounts from line 12, lines 14 through 17, lines 19 and 20 in column (g), and line 21. Enter here and on the appropriate lines of your return. Partnerships and S corporations -- see instructions . . . . .	<b>22</b>	2,580
23 For assets shown above and placed in service during the current year, enter the portion of the basis attributable to section 263A costs . . . . .	<b>23</b>	

For Paperwork Reduction Act Notice, see separate instructions.

## 2009 Federal Depreciation Schedule

FUSION POWER ASSOCIATES  
52-1162794

05-01-2010

Description	Date	Method	Year	Cost	Land/ Other	§179	Spec Allow	Basis	Prior	Current
<b>0</b>										
FURNITURE	01-01-84	200DBHY	7	36,169	0	0	0	36,169	36,169	0
CONDO	01-01-84	A S/LMM	30	134,205	56,805	0	0	77,400	60,631	2,580
2 Assets			Totals	170,374	56,805	0	0	113,569	96,800	2,580
2 Assets			Grand Totals	170,374	56,805	0	0	113,569	96,800	2,580

\* Asset disposed this year

~C Carryover basis in like-kind exchange transaction

~B Excess basis in like-kind exchange transaction

## 2009 AMT Depreciation Schedule

FUSION POWER ASSOCIATES  
52-1162794

05-01-2010

Description	Date	Method	Year	Basis	Prior	AMT	Regular	Adjust
<b>0</b>								
FURNITURE	01-01-84	150DBHY	10	36,169	0	0	0	0
CONDO	01-01-84	A S/LMM	40	77,400	7,742	2,580	2,580	0
2 Assets		Totals		113,569	7,742	2,580	2,580	0
2 Assets		Grand Totals		113,569	7,742	2,580	2,580	0

\* Asset disposed this year

~C Carryover basis in like-kind exchange transaction

~B Excess basis in like-kind exchange transaction

2009 DETAIL STATEMENTS

FUSION POWER ASSOCIATES  
52-1162794

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STATEMENT #1 - Occupancy (990-PF PG 1 Line 20)

CONDO FEES.....	4,550
UTILITIES.....	2,877

TOTAL CARRIED TO 990-PF PG 1 Line 20..... 7,427

---

STATEMENT #2 - Travel, conference, meetings (990-PF PG 1 Line 21)

COALITION FOR PLASMA SCIENCE MEETING.....	10,870
CONFERENCE, CONVENTION, MEETING MISC.....	23,211
ANNUAL MEETING.....	19,542
TRAVEL.....	2,371

TOTAL CARRIED TO 990-PF PG 1 Line 21..... 55,994

---

STATEMENT #3 - Contributions, gifts, grants (EZ1 PF1 Line 1)

LAWRENCE BERKLEY NATL LAB.....	11,648
COALITION FOR PLASMA SCIENCE.....	11,419
SMALL DONATIONS.....	2,220

TOTAL CARRIED TO EZ1 PF1 Line 1..... 25,287

---

Part IX-A

1. Summary of Charitable Activities

Since its inception in August 1979, FPA has continuously conducted programs designed to provide the scientific community and the public with information about fusion power generation as a potential source to supply a portion of the world's future energy needs.

(1) Publishing a bimonthly newsletter for members and other interested parties. The newsletter reports on technical developments relating to fusion power generation, discusses administrative and governmental activities and decisions relating to fusion power development and announces meetings, forums, and symposia at which fusion power will be discussed. Copies of the newsletters published for March/April and November/December 2009 are attached as Attachments A-1 and A-2. Fusion Power Associates also published, bimonthly, Fusion Power Report, which portrays more in-depth coverage of fusion news and events. Copies of this publication for May/June and November/December 2009 are attached as A-3 and A-4.

(2) Sponsoring conferences, forums and other studies to assess the technological advances of fusion power generation. The product of any such conference, forum or study is made available to all persons, including interested government officials and members of the public. FPA sponsored one conference in 2009. The proceedings of conferences are published in the Journal of Fusion Energy (Plenum Press).

(3) Research and analyses in fusion. The focus of such research and analyses is the program management and development of fusion science and technology. FPA received grants in 2009 from the American Physical Society, and the IEEE.

FPA will continue to conduct conferences, publish newsletters and periodicals, reports, and to respond to invitations to make presentations to government panels, public forums, or other groups interested in fusion power production or energy production generally. In addition, FPA anticipates that, as funding permits, the above activities may be expanded.

Fusion Power Associates  
Attachment to 990 PF Form for 2009

**Directors**

Prof. Mohamed Abdou  
MAE Department  
UCLA, 44-114, Eng. 4  
420 Westwood Plaza  
Los Angeles CA 90095

Mr. Michael Campbell  
EMC Associates, LLC  
17117 Tallow Tree Lane  
San Diego, CA 92128-5608

Dr. Don Correll  
Lawrence Livermore National Laboratory  
PO Box 808  
Livermore, CA 94550

Mr. Ben Cross  
Savannah River National Laboratory  
Aiken, SC 29808

Dr. N. Anne Davies  
U.S. Dept. of Energy (retired)  
305 Old Bucklodge Lane  
Boyd's, MD 20841

Dr. Gerald L. Kulcinski  
Associate Dean for Research  
University of Wisconsin  
1415 Engineering Drive  
Madison WI 53706-1691

Dr. B. Grant Logan, Vice Chair  
Heavy Ion Fusion Program  
Lawrence Berkeley National Lab.  
Mail Stop 47-112  
Berkeley CA 94720

Dr. Keith Matzen, Director  
Pulsed Power Program  
Dept. 1670, MS 1191  
Sandia National Laboratories  
POBox 5800  
Albuquerque NM 87185

Dr. Robert L. McCrory, Director  
Laboratory for Laser Energetics  
University of Rochester  
250 East River Rd.  
Rochester NY 14623

Dr. Dale Meade (retired)  
Princeton Plasma Physics Laboratory  
48 Oakland Street  
Princeton NJ 08540

Dr. Stan Milora, Director  
Fusion Energy Division  
Oak Ridge National Laboratory  
P.O. Box 2008  
Oak Ridge TN 37831

Dr. Edward Moses, Associate Director  
Lawrence Livermore National Lab  
P.O. Box 808, L-466  
Livermore CA 94550

Prof Farrokh Najmabadi, Chairman  
457B Engineering Bldg. II  
Univ. of California, San Diego  
MC 0438  
La Jolla CA 92093-0438

Prof. Gerald Navratil  
Dept of Applied Physics  
Columbia University  
500 W. 120th Street  
206 SW Mudd  
New York NY 10027

Dr. Stephen Obenschain, Head  
Laser Physics Branch (Code 6730)  
Naval Research Laboratory  
Washington DC 20375

Dr. Nicole Petta  
Schafer Corporation  
448 Lindbergh Avenue  
Livermore, CA 94526

Dr. Miklos Porkolab, Director  
MIT Plasma Fusion Center  
167 Albany Street  
Cambridge MA 02139

Dr. Stewart Prager, Director  
Princeton Plasma Physics Laboratory  
Princeton University  
P.O.Box 451  
Princeton, NJ 08540

Dr. John Sheffield  
University of Tennessee  
1070 Rome Drive  
Roswell GA 30075

Dr. Ronald Stambaugh  
General Atomics  
P.O. Box 85608  
San Diego, CA 92186

Dr. James W. Van Dam, Director  
Institute for Fusion Studies  
University of Texas  
1 University Station C1500  
Austin TX 78712

Mr. Tom Weaver  
The Boeing Company  
P.O. Box 516  
St. Louis, MO 63166

Dr. Glen A. Wurden  
Fusion Energy Program Manager  
Los Alamos National Laboratory  
P.O. Box 1663 E-526  
Los Alamos NM 87545

**Fusion Power Associates  
Attachments to 990 PF Form for 2009**

**Officers**

Dr. Farrokh Najmabadi, Chairman  
457B Engineering Bldg. II  
Univ. of California, San Diego  
MC 0438  
La Jolla CA 92093-0438

Dr. B. Grant Logan, Vice Chair  
Heavy Ion Fusion Program  
Lawrence Berkeley National Lab.  
Mail Stop 47-112  
Berkeley CA 94720

Dr. Stephen O. Dean, President  
Fusion Power Associates  
2 Professional Drive, Suite 249  
Gaithersburg, MD 20879

Dr. Mark Tillack, VP, Communications  
University of California, San Diego  
La Jolla, CA 92120

Ms. Ruth Watkins, VP, Administration and Finance  
Fusion Power Associates  
2 Professional Drive, Suite 248  
Gaithersburg, MD 20879



## FUSION POWER ASSOCIATES EXECUTIVE NEWSLETTER

Attachment A-1

2 Professional Drive, Suite 249, Gaithersburg, MD 20879 • Tel. 301-258-0545 • Fax. 301-975-9869 • e-Mail: Fusionpwrassoc@aol.com

<http://fusionpower.org>

MARCH/APRIL 2009 VOL. 30, NO. 2

### U.S. Set to Receive ITER Funding

The U.S. will receive \$124 million as the first major infusion of funds towards the U.S. contribution to ITER construction. The agreement was reached between House and Senate appropriations conferees and will be part of the FY 2009 Omnibus Appropriations Bill. The U.S. Department of Energy, and other agencies, have been on "continuing resolution" since October 1, 2008 for FY 2009 which ends September 30. The U.S. ITER team has been struggling to meet minimal manpower support for ITER for the past two years, awaiting firm financial support for ITER from Congress.

Under the agreement, the balance of the U.S. Office of Fusion Energy Sciences effort will remain constant at about \$278 million, the same amount provided in FY 2008. The following language accompanies the House version of the FY 2009 Omnibus Appropriations Bill.

#### Fusion Energy Sciences (Office of Science)

"The bill provides \$402,550,000 for this program. Within this amount, \$208,690,000 is provided for Facility Operations with \$36,361,000 for DIII-D, \$15,977,000 for Alcator C-Mod, \$29,774,000 for NSTX, no funds for NCSX, and \$124,000,000 for ITER, and \$64,404,000 is provided for Alternative Concepts Experimental Research with \$16,690,000 for Experimental Plasma Research and no funds for NCSX. The control level is at the Fusion Energy Science level."

#### Inertial Confinement Fusion Ignition and High Yield (NNSA)

"The bill provides \$436,915,000 for the Inertial Confinement Fusion and High Yield Campaign, including \$203,282,000 for Facility Operations and Target Production of which \$13,310,000 above the request is for National Ignition Facility operations and target production, and \$15,000,000 above the request is to support single shift operations on the Z machine and to explore advanced concepts including \$2,000,000 for linear transformer driver concepts."

### Prager Takes Helm at PPPL

The U.S. Department of Energy announced Jan. 15 that Princeton University has been awarded a five-year management and operating contract to continue managing the DOE's Princeton Plasma Physics Laboratory. The contract runs from April 1, 2009, to March 31, 2014, with a 60-day transition period beginning this month, and with a provision that permits the University to earn up to five additional years of management of the lab. Professor Stewart Prager (University of Wisconsin) will be Director of the lab, succeeding current Director Robert J. Goldston. Princeton has managed the plasma physics lab for more than 57 years.

Stewart Prager, the new Director of the lab under the new contract, said, "As a DOE national laboratory, PPPL enjoys the responsibility and opportunity to help define a fusion program for the U.S. that will rapidly advance us toward fusion energy, and return our country to the world forefront in this quest." "Within PPPL, the planned upgrade to the National Spherical Torus Experiment (NSTX) will prepare the U.S. for possible large next steps in fusion energy, as NSTX confines plasmas at very high pressure in a relatively small volume."

Prager added, "At PPPL, we will also advance the fundamental understanding of the plasma state of matter, and apply that knowledge even beyond fusion, from plasmas used in industrial processes to plasmas in the universe."

### Livermore Looks Beyond NIF

The laser-based National Ignition Facility (NIF) is nearing completion at the Lawrence Livermore National Laboratory (LLNL). A dedication will be held in late May; a "campaign" to ignite small pellets containing fusion fuel will begin in 2010. With confidence of success running high, scientists at LLNL have been looking beyond NIF, considering what they believe may be the fastest way for fusion to impact the world's energy needs: the fusion-fission hybrid power plant. Dubbed "LIFE" for Laser Inertial Fusion-Fission Energy, the plant would use a repetitively-pulsed neutron-rich fusion source to drive a more energy-rich fission blanket surrounding the fusion region.

LLNL notes the fission blanket could consist of nuclear waste from today's nuclear fission plants, thereby "dramatically shrinking the planet's stockpile of spent nuclear fuel and other materials that lend themselves to nuclear proliferation." They say, "LIFE power plants could generate gigawatts of power 24 hours a day for as long as 50 years without refueling, while avoiding carbon dioxide emissions, easing nuclear proliferation concerns and minimizing the concerns associated with nuclear safety and long-term nuclear waste disposal." This technology "could produce enough energy to meet the world's energy needs for hundreds of thousands of years," they say.

LLNL is preparing a LIFE Project Plan they say will aim at a Pilot Plant in 2020 and a Demonstration Power Plant in 2030.

Papers have been presented at several recent scientific conferences. Details of the concept can be found at: [https://lasers.llnl.gov/missions/energy\\_for\\_the\\_future/life/](https://lasers.llnl.gov/missions/energy_for_the_future/life/)

## **FESAC Endorses Inertial Report**

In a February 5 letter to the U.S. Department of Energy (DOE), its Fusion Energy Sciences Advisory Committee (FESAC) endorsed the report of a FESAC panel chaired by Professor Riccardo Betti (U. Rochester) saying, "We believe it provides a useful platform for the stewardship of the Joint HEDLP (High Energy Density Laboratory Plasmas) Program and a detailed plan for the development of the inertial fusion energy science program." The FESAC said, "As requested, the panel has identified the compelling research opportunities in fundamental HEDLP science and identified the scientific issues of implosion physics and target design that need to be addressed to make the case for inertial fusion energy."

The letter and complete report are posted at: <http://www.ofes.fusion.doe.gov/fesac.shtml>

## **Fusion in the Stimulus Package**

Fusion research may benefit from the U.S. economic stimulus bill recently passed by Congress. The package contains \$1.6 billion for the U.S. Department of Energy Office of Science, of which fusion is a part. A summary of the bill, issued by House Speaker Nancy Pelosi notes the Office of Science "funds research in such areas as climate science, biofuels, high-energy physics and fusion energy sciences -- areas crucial to our energy future."

The bill also provides \$400 million for a new office in DOE called ARPA-E "to support high-risk, high-payoff

research into energy sources and energy efficiency in collaboration with industry."

Pelosi's summary is posted at <http://fire.pppl.gov>

The full text of the spending portion of the bill is posted at: [http://thomas.loc.gov/home/h1/Recovery\\_Bill\\_Div\\_A.pdf](http://thomas.loc.gov/home/h1/Recovery_Bill_Div_A.pdf)

Tax aspects of the bill are posted at: [http://thomas.loc.gov/home/h1/Recovery\\_Bill\\_Div\\_B.pdf](http://thomas.loc.gov/home/h1/Recovery_Bill_Div_B.pdf)

## **ITER Update**

The ITER Divertor Test Platform, to develop and test the maintenance robot and remote handling operations, has been inaugurated in Finland. The facility hosts the first full-size prototype of the Cassette Multifunctional Mover. The Cassette Mover is required to transport ITER's divertor cassettes, each weighing 9 to 10 tons, along a complex path from the transfer cask to the plasma chamber.

The world's largest synthetic diamonds are being developed as windows for the electron cyclotron heating gyrotrons for ITER. Each window will be 1.1 millimetres thick and up to 106 millimetres in diameter. The development is a joint venture between the EU and Japan. Manufacturing is expected to start in 2011, with delivery in 2015.

Representatives of the Australian scientific community and the government have expressed their intention to align their national fusion program to support the ITER program and are exploring the possibility of seeking to enter into a formal Cooperation Agreement with the ITER Organization. Formal participation would require approval by the ITER Council. The next ITER Council meeting is scheduled for June 17-18 in Japan

## **Woodruff Scientific Joins Fusion Power Associates**

Woodruff Scientific, Inc., Seattle, WA, has joined Fusion Power Associates as a Small Business Affiliate. Simon Woodruff, President, will represent the company. He can be reached at: [simon@woodruffscientific.com](mailto:simon@woodruffscientific.com) Woodruff Scientific aims to address critical scientific issues in the development of innovative fusion concepts by building experiments and running advanced simulations, and through partnerships with industry and academia. Their web site is: <http://www.woodruffscientific.com>



## FUSION POWER ASSOCIATES EXECUTIVE NEWSLETTER

2 Professional Drive, Suite 249, Gaithersburg, MD 20879 • Tel. 301-258-0545 • Fax. 301-975-9869 • e-Mail: Fusionpwrassoc@aol.com

<http://fusionpower.org>

NOVEMBER/DECEMBER 2009 VOL. 30, NO. 6

### Last Issue

After 30 years of continuous publishing, this is the last issue of Fusion Power Associates Executive Newsletter. With the pervasiveness of the internet, the information contained in these newsletters has evolved so that it is more rapidly and comprehensively transmitted in our Fusion Program Notes (FPNs). These FPNs are distributed by email as news breaks and also are archived on our web site: <http://fusionpower.org> and click on Fusion Program Notes.

### Congress Passes FY 2010 Fusion Budgets

The U.S. Congress has passed the FY 2010 Energy and Water Appropriations bill, which reconciles in conference differing versions previously passed in the House and Senate. The bill provides appropriations for the Department of Energy including funding for the Office of Fusion Energy Sciences (OFES) and the Inertial Confinement Fusion and High Yield Campaign (ICF).

The bill provides \$426 M for the OFES, which is \$5 M higher than the President's request. The bill does not specify how that \$5 M should be allocated but does provide the following statement:

*Fusion Energy Sciences.*-The conference agreement provides \$426,000,000 for Fusion Energy Sciences. The House proposed \$20,000,000 for the laser fusion program at the Naval Research Laboratory(NRL). It also directed the Department of Energy to report to the House and Senate Committees on Appropriations on the potential of the KrF laser for commercial fusion. The Senate provided no comparable direction. The conference agreement includes no explicit funding for NRL and supports the House reporting requirement. This report is due not later than 60 days following enactment of this Act. The conferees encourage the Secretary to explore all possible opportunities to ensure that this program, which offers unique potential for long-term energy independence, is not abandoned for lack of a bureaucratic home.

The bill also provides the following allocations for the ICF program:

*Inertial Confinement Fusion Ignition and High Yield Campaign* .- The conference agreement provides \$457,915,000 for the Inertial Confinement Fusion and High Yield Campaign. The conference agreement provides \$16,500,000 above the request for the operation of Z machine and the Omega facility to restore each facility to fiscal year 2009 levels. Further, \$4,500,000 above the budget request is provided for the Laboratory for Laser Energetics

### U.S. Fusion Program Receives Additional \$8 M Stimulus

The U.S. Fusion Energy Sciences Program has received an additional \$8 M in funds as part of the American Recovery and Reinvestment Act (ARRA), commonly known as economic stimulus funds. The money is in addition to that reported previously of \$83 M, bringing the total to \$91 M.

The additional funds are to be used to provide Fellowships and Early Career Awards for fusion research.

### House Science Committee Holds Fusion Hearing

The U. S. House of Representatives Committee on Science and Technology, Subcommittee on Energy and Environment, held a hearing titled "The Next Generation of Fusion Energy Research" on Thursday October 29, 10 AM to 12 noon in Room 2318 of the Rayburn House Office Building in Washington, DC.

The witnesses were:

**Edmund Synakowski**, Associate Director for Fusion Energy Sciences, DOE Office of Science

**Stewart Prager**, Director, Princeton Plasma Physics Laboratory

**Thom Mason**, Director, Oak Ridge National Laboratory

**Riccardo Betti**, University of Rochester

**Raymond J. Fonck**, University of Wisconsin .

Information on the hearing is posted at [http://science.house.gov/publications/hearings\\_markups\\_details.aspx?NewsID=2653](http://science.house.gov/publications/hearings_markups_details.aspx?NewsID=2653)

A link on the right hand side labeled "Webcast" provides the actual webcast. Links on the left side provide the written testimonies provided by the Subcommittee chair, Brian Baird (D-WA) and the witnesses.

## **FPA Awards to Stacey, Lee, Garnier and Latkowski**

Fusion Power Associates Board of Directors has announced the recipients of its Distinguished Career, Leadership, and Excellence in Fusion Engineering Awards.

### **Distinguished Career Award**

Weston M. Stacey, Jr., Callaway Regent's Professor of Nuclear Engineering at Georgia Institute of Technology, has been chosen by Fusion Power Associates (FPA) Board of Directors to receive the 2009 FPA Distinguished Career Award.

In selecting Prof. Stacey, the FPA Board recognizes his decades of outstanding career contributions to fusion research and development, including his pioneering contributions to power-producing fusion reactor designs, to the INTOR design which was a forerunner for ITER, and to conceptual designs of fusion-fission systems.

FPA Distinguished Career Awards have been given annually since 1987 to individuals who have made distinguished lifelong career contributions to fusion development.

### **Leadership Award**

Dr. G. S. Lee, President of the Korean National Fusion Research Institute (NFRI) and former Director-General of the ITER Korean Domestic Agency, has been chosen to receive the 2009 FPA Leadership Award.

In selecting Dr. Lee, the FPA Board recognizes the leadership he has provided to the KSTAR tokamak project, to Korean participation in the ITER project, and his leadership of the International Fusion Research Council (IFRC).

FPA Leadership Awards have been given annually since 1980 to individuals who have shown outstanding leadership qualities in accelerating the development of fusion.

### **Excellence in Fusion Engineering Award**

Darren Garnier of Columbia University and Jeff Latkowski of Lawrence Livermore National Laboratory have been chosen to receive 2009 FPA Excellence in Fusion Engineering Awards.

In selecting Dr. Garnier, the FPA Board notes the contributions and leadership he has provided for the design, fabrication and operation of the Levitated Dipole Experiment (a joint Columbia-MIT project located at MIT) and his contributions to the diagnostics and control systems for that experiment.

In selecting Dr. Latkowski, the FPA Board notes the contributions and leadership he has provided for the LIFE fusion-fission project, the NIF Final Safety Analysis, and to LLNL contributions to the non-laser portions of the national High Average Power Laser (HAPL) program.

FPA Excellence in Fusion Engineering Awards, established in memory of MIT professor David J. Rose, have been given annually since 1987 to recognize individuals in the relatively early part of their careers who have shown both technical accomplishment and potential to become exceptionally influential leaders in the fusion field.

The Awards will be presented at Fusion Power Associates Thirty-year Anniversary Annual Meeting and Symposium, December 2-3, in Washington, DC

A list of previous Award recipients is posted at <http://fusionpower.org> and click on Awards.

## **Moses, Betti Receive Teller Medals**

Ed Moses (LLNL) and Ricardo Betti (U. Rochester) are the recipients of the 2009 Edward Teller Medal, sponsored by the American Nuclear Society. The medals were presented at the Sixth International Conference on Inertial Fusion Sciences and Applications (IFSA) in San Francisco on September 10.

Moses was cited for his "leadership in the development and completion of the National Ignition Facility" (NIF).

Betti was cited for his "seminal contributions to the theory of hydrodynamic instabilities, implosion dynamics and thermonuclear ignition in inertial confinement fusion."



# Fusion Power Report

Complete Coverage Of Worldwide Fusion Developments

Vol. 30 No. 5/6

May/June 2009

Page 11

## SLANTS & TRENDS

The U. S. Fusion Energy Sciences program would receive \$421 million in FY 2010, including an additional \$135 million for ITER construction, according to President Obama's budget submission.

See Story on page 12

\* \* \*

All 192 NIF laser beams have been fired simultaneously into a test cell, resulting in 1.1 MJ of ultraviolet light energy.

See Story on page 12

\* \* \*

The ITER Organization is looking to hire an additional 74 people to add to their current staff of 392.

See Story on page 12

\* \* \*

Japan has opened a new fusion site in Rokkoshō, as part of the "Broader Approach" agreement with the European Union. Activities at the site will include cooperation on a variety of issues required for the construction of a demonstration fusion electric power plant

See Story on page 13

\* \* \*

U.S. Department has launched ARPA-E, a new agency to foster innovation in energy-related technologies by issuing a request for proposals.

See Story on page 13

\* \* \*

John Holdren has been confirmed as President Obama's Science Advisor; Steve Koonin has been nominated as USDOE Under Secretary of Science; Bill Brinkman has been nominated as Director of USDOE Office of Science; and Ed Synakowski has been named as the new head of the U.S. fusion energy sciences program

See Stories on pages 15-16

\* \* \*

Robert Aymar has been named Special Advisor for ITER to the head of the French Atomic Energy Commission (CEA).

See Story on page 16

### Inside This Issue

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## U.S. FY 2010 Budget Submission

President Obama sent Congress the details of his FY2010 budget requests on May 7. Included in the requests are \$26.4 B for the Department of Energy (DOE) compared to \$33.7 B in FY 2009. The Department also has received \$38.7 B in "stimulus" money in FY 2009, most of which will be spent in future years.

Within DOE, the National Nuclear Security Administration (NNSA) would receive \$9.9 B compared to \$9.1 B in FY 2009. The NNSA received none of the DOE "stimulus" money.

Within DOE, the Office of Science would receive \$4.9 B compared to \$4.8B in FY 2009. The Office of Science also received \$1.6 B in "stimulus" money in FY 2009, to be spent over several years.

Within the Office of Science, the Fusion Energy Sciences (OFES) program would receive \$421 M compared to \$403 M in FY 2009. The OFES will likely receive "a little over \$70 M" from the Office of Science \$1.6 B "stimulus" money according to a DOE source, but this has not been announced by DOE. Within the \$421 M OFES request is \$135M for U.S contributions to the international ITER project compared to \$124 M in FY 2009. The DOE estimates the total U.S. contribution to ITER construction will be between \$1.4 B and \$2.2 B. The range will be narrowed in late FY 2010 or early FY 2011. The domestic (non-ITER) portion of the OFES program would receive \$286 M compared to \$281 M in FY 2009, plus the estimated \$70 plus M in "stimulus" funds mentioned above.

Within NNSA, the Inertial Confinement Fusion Ignition and High Yield Campaign would receive \$437 M, the same as in FY 2009.

Links to the complete DOE budget submission documents have been posted at <http://fire.pppl.gov>

## Livermore Fires NIF Laser Beams

Scientists at the Lawrence Livermore National Laboratory (LLNL) have completed construction of the National Ignition Facility (NIF) and successfully fired all 192 laser beams simultaneously into a test cell. The lasers delivered almost 2 Megajoules of infrared laser light, which was then successfully converted to 1.1 Megajoules of ultraviolet light, the wavelength needed to conduct ignition experiments. The energy and pulse shape of the beams

approximately match that needed for achieving ignition,

NIF Director Ed Moses said, "This is an incredible milestone on our journey to ignition. We are well on our way to achieving what we set out to do -- controlled, sustained nuclear fusion and energy gain for the first time ever in a laboratory setting."

In certifying NIF completion, the Department of Energy stated that the completion of NIF "opens the door to scientific advancement and discovery that promises to enhance our national security, could help to break America's dependence on foreign oil, and will lead to new breakthroughs in the worlds of astrophysics, materials science and many other scientific disciplines."

DOE National Nuclear Security Administration (NNSA) Administrator Thomas D'Agostino, which sponsors the project, said "NIF will be a cornerstone of a critical national security mission, ensuring the continuing reliability of the U.S. nuclear stockpile without underground testing, while also providing a path to explore the frontiers of basic science, and potential technologies for energy independence."

NIF Director Ed Moses can be reached at [moses1@LLNL.gov](mailto:moses1@LLNL.gov)

## ITER Update

On March 18, the ITER Organization advertised openings for 74 new hires. Only people from one of the seven ITER Parties may apply. Persons must apply by October 5. Information is at [http://www.iter.org/a/index\\_jobs.htm](http://www.iter.org/a/index_jobs.htm) As of late April, there are 392 staff members at the ITER site, including 248 professionals and 145 support.

ITER now has its own YouTube channel at <http://www.youtube.com/user/iterorganization>

Since early March, prototypes being developed for ITER have been on display in the lobby and in front of the ITER Headquarters building in Cadarache. The prototypes include divertor cassette and blanket modules.

Leveling of the 82 hectare site for the tokamak platform is nearing completion. The next step will be the pre-excavation of the tokamak pit and the construction of the poloidal field coil winding facility.

Also, according to ITER Director General Kaname Ikeda, "the design of the ITER machine had been reviewed down to the last bolt and, although there are issues to be resolved, we are making good progress." Ikeda notes that "twelve procurement arrangements have been signed and the first manufacturing of strands for the ITER magnets has begun."

Ikeda also said, "Major challenges lie ahead, however. The most challenging task of the next months is to define the new project baseline, meaning that we have to define the scope and schedule of the project, and at the same time address the question of monetary resources." The ITER Organization is also in the process of "procurement process optimization" among the ITER Parties "to achieve equal distribution among all the Members both in terms of manufacturing and in terms of cost," Ikeda said.

The ITER Technical Advisory Group, chaired by Michel Huguet, held its 5th meeting in early April. The group reviewed the ITER Organizational structure and the overall procurement and management programs, while focusing on technical issues such as the ITER hot cell, the design of the vacuum vessel, and blanket and remote handling activities.

The European ITER Domestic Agency, called "Fusion for Energy (F4E)", has signed a contract for the manufacture of 62 tons chromium-plated copper strand, which will form part of ITER's superconducting magnet system. This contract marks Europe's first "in-kind hardware contribution" to the ITER project.

The ITER Organization and the Indian ITER Domestic Agency have signed a Procurement Arrangement for ITER's Diagnostic Neutral Beam Power Supplies. The contract was signed April 19 in Paris.

## Japan Opens New Fusion Site

On April 10, the Japanese government officially opened the new International Fusion Energy Research Center in Rokkosho. The site is sometimes also referred to as the "Broader Approach Site" since it was conceived during negotiations between Europe and Japan in deciding the site for ITER. As part of the agreement to locate ITER in Europe, Europe and Japan agreed to cooperate in developing a broader range of activities aimed at develop-

ing the technologies required for a commercial fusion energy source. Central to the EU-Japan activities based in Rokkosho will be the proposed International Fusion Materials Irradiation Facility (IFMIF) and related Engineering Validation and Engineering Design Activities (EVEDA). In addition to the facility just commissioned, Rokkosho will also be the home of other "broader approach" activities, including a supercomputer and remote handling building, a fusion demonstration reactor R&D building, and an IFMIF accelerator prototype building. These latter buildings are scheduled for occupancy in March 2010.

In contrast to the EU-Japan focus and commitment to fusion engineering development aimed towards a demonstration power plant, the U.S. has essentially eliminated fusion engineering and technology development from its fusion portfolio, focusing instead on fusion "science."

## DOE Launches ARPA-E

In a speech to the National Academy of Sciences, President Obama outlined a bold commitment to basic and applied research, innovation and education. The President announced that for the first time, the US is funding the Advanced Research Projects Agency - Energy, or ARPA-E.

ARPA-E's mission is to create transformational energy-related technologies for the nation, focusing on developing energy technologies to reduce imports of energy, to reduce energy-related emissions including greenhouse gases, and to improve energy efficiency in all economic sectors.

ARPA-E has released its first solicitation. This Funding Opportunity Announcement (FOA DE-FOA-0000065) is funded through the American Recovery and Reinvestment Act of 2009. The FOA is narrowly focused on transformational R&D, but intentionally broad on applications and technologies. This announcement is open to the full range of concepts potentially covering all aspects of ARPA-E's Mission Areas. The intent is to harness the creativity of all sectors of the American science and technology communities to advance the ARPA-E Mission Areas and stimulate the pursuit of new and innovative technical opportunities that can spur great leaps forward within those mission impact areas.

The FOA is published on the FedConnect website, [www.FedConnect.net](http://www.FedConnect.net), and on the FedBizOpps website, [www.fedbizopps.gov/](http://www.fedbizopps.gov/) or may be accessed on the ARPA-E website at <http://arpa-e.energy.gov/keydocs/ARPA-E-FOA.PDF>

For additional information about ARPA-E, please visit <http://arpa-e.energy.gov/index.html>

## Recent Advances in Laser Fusion

NRL has achieved High Gain Pellet Designs and Increased Laser Durability.

The Laser Fusion Program at the U.S. Naval Research Laboratory announced two major advances in the development of pure fusion energy with lasers: (1) direct drive target designs that show power plant class gains at KrF laser energies below 1 MJ, and (2) a discovery that has extended the durability of high-energy high-repetition rate KrF lasers. Together these advances substantially increase confidence in this approach to fusion energy.

New target designs are projected to have much higher gains using KrF lasers and direct drive. KrF lasers have several inherent advantages for direct drive targets including: capability for ultra-uniform target illumination, which reduces perturbations imprinted by the laser; and deeper ultraviolet light (wavelength=248 nm) which provides more efficient coupling to the target, thereby allowing higher drive pressures and implosion velocities. The combination of KrF's short wavelength and very broad bandwidth capability (3 THz) suppress deleterious laser plasma instabilities (LPI) that limit the maximum usable laser intensity. In addition, KrF's optical architecture allows easy implementation of focal zooming where the laser spot size follows the imploding pellet, thereby further increasing the coupling efficiency. A new family of high gain direct-drive designs capitalizes on these advantages. Simulations predict a conventional KrF-driven implosion can produce power-plant-class gains (> 120) with laser energy of only 1 MJ. Still higher performance "Shock Ignition" designs have predicted power plant gains at 500 kJ and gains greater than 200 at 1 MJ. In Shock Ignition, which was invented at the University of Rochester, the laser pulse first drives a conventional but lower velocity implosion; then near peak compression a high intensity spike generates a shock to heat the center of the target to ignition temperatures. Work by Rochester and Livermore National Laboratory scientists

corroborate these promising results. High resolution 2-D simulations at NRL indicate that the high gains of these shock ignition designs are robust against hydrodynamic instabilities. Experiments on the Nike KrF laser have explored the 1015-1016 W/cm<sup>2</sup> intensities used in these designs, and support the expectation that KrF laser light suppresses laser plasma instability. Shock Ignition designs have predicted gains similar to Fast Ignition, but do not need a multi-petawatt laser or complex targets.

A breakthrough increases the durability and reliability of KrF lasers. The 30-cm aperture Electra KrF laser amplifier recently demonstrated 10 hours of continuous laser operation at 2.5 Hz (approximately 90,000 shots) utilizing two electron beams to pump the laser gas. This is a significant increase in the durability of large KrF laser systems, which was previously limited to runs of 10,000-20,000 shots. This breakthrough in continuous operation was achieved by eliminating voltage reversals in the high voltage pulse that drives the electron beam pump. This eliminated a failure mode in the pressure foil that separates the electron beam source, which is in vacuum, from the laser gas. The foil must be thin enough to provide high electron transmission efficiency while surviving a hostile environment that includes shock waves, thermal cycling, high electron currents, and exposure to heated laser gas that contains fluorine. Blocking the reverse voltage prevents the foil from emitting electrons, which can carry enough current in isolated spots to drill small holes in the foil. Since this change was made, the Electra facility has fired well over 180,000 electron beams shots on one of its two diodes without a foil failure. Work is now underway to develop an all solid state pulse power system for Electra, which would allow similar testing to the >107 shot regime.

For further information contact Steve Obenschain: [steve.obenschain@nrl.navy.mil](mailto:steve.obenschain@nrl.navy.mil)

## Tokamak Fusion-Fission Hybrid

Bill Stacey, Callaway Regent's Professor of Nuclear Engineering at Georgia Institute of Technology, has a long history of contributions to fusion. He has recently posted on their web page a paper entitled "Georgia Tech Studies of Sub-Critical Advanced Burner Reactors with a D-T Fusion Tokamak Neutron Source for the Transmutation of Spent Nuclear Fuel." The paper also gives references to 31 previous papers over the past 10 years

relating to the subject of tokamak fusion-fission hybrids.

In the current paper, he describes a design called SABR (for Sub-critical Advanced Burner Reactor), a 3000 MWth sodium-cooled tokamak of the ITER type. "Because such a reactor concept is based on nuclear and reprocessing technology being developed in the DOE Nuclear Energy Program and because the neutron source is based on physics and technology that is the design basis for and that will be tested on ITER, such a SABR could potentially become operational within 25-30 years," he says.

The paper can be found at <http://www.frc.gatech.edu> and click on "Transmutation Reactors" and then on reference 18.

Bill can be contacted at [weston.stacey@nre.gatech.edu](mailto:weston.stacey@nre.gatech.edu)

## Senate Confirms Holdren as new OSTP Director

John Holdren was confirmed March 19 by the Senate as the new Director of the Office of Science and Technology Policy (OSTP). Holdren also will hold the position of Science Advisor to the President.

During his confirmation hearing, Holdren told the senators that he will have four Senate-confirmed associate directors for science, technology, environment, and international affairs. He said he plans to revive the National Science and Technology Council to ensure better coordination and communication among federal science agencies.

When pressed about the Administration's approach to the regulation of carbon dioxide emissions, Holdren cited the president's position of aiming to reduce them "by something like 80 percent in 2050." That reduction would provide a "reasonable chance of confining the global average surface temperature increase to about 2 degrees Celsius." He said it would be "a great challenge to get there," adding that it would offer tremendous opportunities in innovation and subsequent job creation to maintain and improve the U.S. competitive position. Holdren was optimistic that China and India would engage in the process since climate change is hurting their nations. He predicted that there will be much discussion about emission control approaches

and provisions, and told the senators, "it's going to be a long slog. I don't want to kid anybody. This is going to be tough. . . ."

Holdren said, "The cost and complexity of cutting-edge accelerators, telescopes, and certain experimental energy technologies, such as the ITER fusion experiment, are good reason in themselves for sharing the costs and risks internationally." "I have been involved in international cooperation on fusion and other energy technologies since 1971 and I will be most eager to put the insights derived from that experience to good use at OSTP," he said.

## Holdren Comments on Fusion

At an energy symposium at MIT April 13, the following exchange took place between John Holdren, Science Advisor to President Obama, and the program chairman, Rep Edward Markey:

Markey asked:

"Can you talk a little bit about how you view the development of technologies today, and what you believe is possible technologically if we get the policies right in terms of solving this problem."

After commenting on a number of technologies, Holdren said:

"We need to develop and deploy approaches to nuclear energy that can minimize the liabilities that have inhibited expansion of that carbon-free energy source up until now. We need to see if we can make fusion work. This is a quest in which I've been engaged since 1965. Again, I started at MIT my work in that domain. At that time people thought fusion was 15 years away. Now people think it's 40 or 50 years away. We need to shrink that time scale again by increasing the investment for making that domain."

## Koonin to be DOE Under Secretary for Science

The White House has announced its intention to nominate Dr. Steven E. Koonin to be Department of Energy Under Secretary for Science. Dr. Koonin has served as chief scientist of British Petroleum (BP), the world's second largest oil company, since 2004. As chief scientist, he has been responsible for BP's long-range technology plans and activities,

particularly those "beyond petroleum." Previously he was at the California Institute of Technology, joining the university in 1975. He served as Provost there 1995-2004. He received his BS in Physics at Caltech and his Ph.D. in theoretical physics from MIT.

He has served on numerous advisory committees. He chaired a National Academy inertial confinement fusion program review in 1990. Among their recommendations was that the DOE should accelerate the construction of the KrF Nike laser at the Naval Research Laboratory and that the construction of the Omega laser at the University of Rochester should be "started immediately." The committee also criticized the DOE for its overly restrictive classification policy and called on Secretary of Energy James Watkins to "form a panel to review present ICF classification guidelines and to schedule future target physics declassification." Koonin gave the first public presentation of that report at Fusion Power Associates 1990 annual meeting. Koonin also served on the DOE's Inertial Confinement Fusion Advisory Committee (ICFAC) in the mid 1990's. He was the recipient of Fusion Power Associates Leadership Award in 1994 in recognition of the "major impact he has had on the programs and plans of the inertial confinement fusion program."

## **Brinkman Nominated as DOE Office of Science Director**

President Obama has nominated William F. Brinkman to be Director of the Department of Energy's Office of Science. He succeeds Raymond Orbach, who held both that position and the position of Under Secretary for Science. Steven Koonin has been nominated for the latter position separately.

Brinkman is currently a Senior Research Physicist in the Physics Department at Princeton University. He received his Ph.D. in physics from the University of Missouri in 1965. After a one year post-doctoral position at Oxford University, he joined Bell Laboratories in 1966, rising to the position of Director of the Chemical Physics Research Laboratory there in 1974 and later Director of the Physics Research Division 1981-84. In 1984, he moved to the Sandia National Laboratories in Albuquerque as Vice President of Research. In 1987, he returned to Bell Laboratories as Executive Director of the Physics Research Division and later became Physi-

cal Sciences Research Vice President (1993) and Vice President Research (2000). He joined Princeton University upon his retirement from Bell Labs.

## **Synakowski Named New Head of U.S. Fusion Energy Effort**

Ed Synakowski, Fusion Energy Program Leader at the Lawrence Livermore National Laboratory (LLNL) and a current member of Fusion Power Associates Board of Directors, has been named to head the U.S. Department of Energy's Office of Fusion Energy Sciences (OFES) effective June 7. He succeeds Ray Fonck (University of Wisconsin), who resigned the post in August 2008.

After receiving his Ph.D. at the University of Texas in 1988, Ed joined the Princeton Plasma Physics Laboratory (PPPL), where he worked on the Tokamak Fusion Test Reactor (TFTR) and later the National Spherical Torus Experiment (NSTX) until joining LLNL in January 2006.

Ed can currently be reached at [Ed\\_S@LLNL.gov](mailto:Ed_S@LLNL.gov)

A copy of the DOE letter announcing his appointment by Pat Dehmer, Deputy Director of the DOE Office of Science is available on request from Fusion Power Associates.

## **Aymar Named CEA ITER Advisor**

Robert Aymar has been named Special Advisor for ITER to the Administrator-General of the French Atomic Energy Commission (CEA). Aymar was head of the ITER team from 1994-2003 and Director-General of the CERN high-energy accelerator lab in Geneva 2003-2008. He also was responsible for the design and construction of Tore Supra, the French superconducting tokamak, dating back to 1977. He was a recipient of Fusion Power Associates 2000 Leadership Award and 2003 Distinguished Career Award and served on the Fusion Power Associates Board of Directors.

## **Roberts Heads ITER Export Control Group**

Mike Roberts has been named Chair of the ITER Export Control Group. The Group was established by the ITER Council in June 2008 in recognition of the need properly handle and control the dissemination of information provided to the ITER Organi-

zation by the member Parties and their Domestic Agencies. Roberts, who has been involved with ITER since its inception, when he worked for the U.S. Department of Energy, is joined in the Group by Paul-Henri Tuinder, John Glowienka, Akko Maas, Leslie Meyssonier, and Hiroshi Matsumoto.

The Group held its first meeting the last week of February and participated in the first Export Control Awareness Training for ITER Organization Staff. They will hold their next meeting in Washington in April.

Roberts said, "The aim of the working meetings was twofold. The first aim was to look at the progress being made by the ITER Organization on export control in anticipation of the upcoming Washington meeting, and to give a sharper focus to those preparatory efforts. The second aim was to begin the process of creating awareness about export control."

"We need to understand how we identify and handle sensitive items of information, technology, and equipment that the Members will be providing to the ITER Organization as part of their Procurement Arrangements," Roberts said.

## **Kulcinski Receives U. Wisconsin Award**

Prof. Gerald L. Kulcinski received the University of Wisconsin's Hilledale Award in the Physical Sciences on April 9. The awards are given annually to recognize combined excellence in teaching, research and service at the university.

Jerry is a recipient of Fusion Power Associates 1992 Leadership Award and a member of Fusion Power Associates Board of Directors. He can be reached at kulcinski@enr.wisc.edu

## **Conn Named President of The Kavli Foundation**

March 10, 2009- The Kavli Foundation has announced the appointment of Dr. Robert W. Conn as its new president - only the second president since the Foundation was established in 2000. Dr. Conn began serving as the Foundation's President in late April.

Dr. Conn is a renowned academic and business leader, and an acclaimed scientist whose research is focused on plasma physics and fusion energy development. Most recently, he served as a Managing Director of Enterprise Partners Venture Capital (EPVC), a leading venture capital firm that has invested over \$1.1 billion in technology and life sciences companies. Prior to EPVC, a 30-year career in academics and research included serving from 1993 to 2002 as Dean of the Jacobs School of Engineering at the University of California, San Diego (UCSD). While dean, he led the School through a period of unprecedented growth both in scale and reputation, establishing what is today among the top-ranked engineering schools in the United States. Before joining UCSD, Dr. Conn was Professor of Applied Science at the University of California, Los Angeles and earlier, the Romnes Faculty Professor at the University of Wisconsin-Madison. He founded the Institute of Plasma and Fusion Research at UCLA and co-founded the Fusion Energy Institute at the University of Wisconsin.

"Dr. Conn is a scientist whose many contributions to plasma physics, fusion energy and materials have been acknowledged and honored by his colleagues. He is also a leader and administrator whose accomplishments range from building one of the most successful engineering schools in the country to being a key member, as well as founder, of businesses dedicated to the applications of science," said Fred Kavli, founder and chairman of The Kavli Foundation. "We look forward to Dr. Conn providing the same innovative leadership at the Foundation that has been the cornerstone of his success throughout his career."

Focusing on astrophysics, nanoscience, neuroscience and theoretical physics, the Foundation's many programs in support of science include establishing 15 research institutes at some of the world's most prestigious universities. The Foundation is also the founding partner of the international Kavli Prizes, which honor scientists in the fields of astrophysics, nanoscience and neuroscience.

"I am delighted and excited to be joining Fred Kavli and team at The Kavli Foundation to help advance the Foundation's vision and mission," said Dr. Conn. "In a short period of time, the Foundation has established remarkable institutes around the world, each focused on the creation of basic knowledge in four fundamental scientific fields.

The Foundation has more recently established with Norway the highly prestigious Kavli Prizes, whose inaugural year 2008 successfully celebrated the achievements of seven distinguished scientists. I look forward to the challenge of sustaining the mission and vision of Fred Kavli and the Foundation, and to working with the extraordinary partners of the Foundation, from universities to scientific academies worldwide who share this commitment to science."

In addition to his academic and business contributions, Dr. Conn has served on many advisory committees for the National Research Council, the National Academy of Sciences, the U.S. Congress and executive branch agencies of the U.S. Government, particularly the Department of Energy (DOE). He has served as chair of the Fusion Energy Sciences Advisory Committee of the DOE and, in the late 1990's, as Chair of the Los Alamos National Laboratory's Physics Division Advisory Committee. He is currently a member of the University of California President's Advisory Committee on Science and Innovation.

Dr. Conn is a distinguished member of the National Academy of Engineering, as well as a Fellow of both the American Physical Society and the American Nuclear Society, Honors include receiving the Ernest O. Lawrence Memorial Award (presented on behalf of the U.S. president), the Department of Energy's Distinguished Associate Award, the American Nuclear Society's Outstanding Research Award and the Curtis W. McGraw Research Award from the American Association of Engineering Education. He also was a recipient of Fusion Power Associates 1992 Leadership Award.

Dr. Conn will become the second president of the Foundation. His appointment will follow the retirement of Dr. David H. Auston, who has served as president since 2002. "I wish to express my deepest gratitude and appreciation for the service and leadership of our current president, David Auston, under whom the Foundation has seen such tremendous growth and success," said Fred Kavli. "He has made an indelible and deep impact on both science and the Foundation, and has set the bar high as we look toward the future."

For a complete profile of Dr. Conn, go to [http://www.kavlifoundation.org/news/09-03-10\\_Kavli\\_Conn.html](http://www.kavlifoundation.org/news/09-03-10_Kavli_Conn.html)

## Calendar

May 31-June 4 36<sup>th</sup> International Conference on Plasma Science and 23<sup>rd</sup> Symposium on Fusion Engineering. <http://cer.ucsd.edu/icopssofe09>

June 24-26 18<sup>th</sup> Topical Conference Radio-frequency Power in Plasmas. Gent, Belgium. <http://www/appliedphysics.ugent.be/capps2009-rf2009/>

Sep 6-11 Sixth International Conference on Inertial Fusion Sciences and Applications (IFSA). San Francisco, CA <https://ifsa09.org>

Sep 21-24 14<sup>th</sup> International Symposium on Laser-aided Plasma Diagnostics. Dastelbrando, Italy. <http://www.igi.cnr.it/lapd14>

### FUSION POWER REPORT

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# Fusion Power Report

Complete Coverage Of Worldwide Fusion Developments

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## SLANTS & TRENDS

The U.S. Congress has passed the FY 2010 Energy and Water Appropriations bill, which reconciles in conference differing versions previously passed in the House and Senate.

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The U.S. Fusion Energy Sciences Program has received an additional \$8 M in funds as part of the American Recovery and Reinvestment Act (ARRA), commonly known as economic stimulus funds.

See Story on page 30

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The U. S. House of Representatives Committee on Science and Technology, Subcommittee on Energy and Environment, held a hearing titled "The Next Generation of Fusion Energy Research"

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The U.S. Department of Energy has awarded \$8.2 million to the University of Rochester to support its Fusion Science Center for Extreme States of Matter for another five years.

See Story on page 30

\* \* \*

Ed Moses (LLNL) and Ricardo Betti (U. Rochester) are the recipients of the 2009 Edward Teller Medal, sponsored by the American Nuclear Society.

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\* \* \*

Fusion Power Associates Board of Directors has announced the recipients of its Distinguished Career, Leadership, and Excellence in Fusion Engineering Awards.

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\* \* \*

Fusion Power Associates Annual Meeting and Symposium will be held December 2-3 in Washington, DC

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## Congress Passes FY 2010 Fusion Budgets

The U.S. Congress has passed the FY 2010 Energy and Water Appropriations bill, which reconciles in conference differing versions previously passed in the House and Senate. The bill provides appropriations for the Department of Energy including funding for the Office of Fusion Energy Sciences (OFES) and the Inertial Confinement Fusion and High Yield Campaign (ICF).

The bill provides \$426 M for the OFES, which is \$5 M higher than the President's request. The bill does not specify how that \$5 M should be allocated but does provide the following statement:

*Fusion Energy Sciences.*-The conference agreement provides \$426,000,000 for Fusion Energy Sciences. The House proposed \$20,000,000 for the laser fusion program at the Naval Research Laboratory(NRL). It also directed the Department of Energy to report to the House and Senate Committees on Appropriations on the potential of the KrF laser for commercial fusion. The Senate provided no comparable direction. The conference agreement includes no explicit funding for NRL and supports the House reporting requirement. This report is due not later than 60 days following enactment of this Act. The conferees encourage the Secretary to explore all possible opportunities to ensure that this program, which offers unique potential for long-term energy independence, is not abandoned for lack of a bureaucratic home.

The bill also provides the following allocations for the ICF program:

*Inertial Confinement Fusion Ignition and High Yield Campaign.*-The conference agreement provides \$457,915,000 for the Inertial Confinement Fusion and High Yield Campaign. The conference agreement provides \$16,500,000 above the request for the operation of Z machine and the Omega facility to restore each facility to fiscal year 2009 levels. Further, \$4,500,000 above the budget request is provided for the Laboratory for Laser Energetics

## U.S. Fusion Program Receives Additional \$8 M Stimulus

The U.S. Fusion Energy Sciences Program has received an additional \$8 M in funds as part of the American Recovery and Reinvestment Act (ARRA), commonly known as economic stimulus funds. The money is in addition to that reported previously of \$83 M, bringing the total to \$91 M.

The additional funds are to be used to provide Fellowships and Early Career Awards for fusion research.

## House Science Committee Holds Fusion Hearing

The U. S. House of Representatives Committee on Science and Technology, Subcommittee on Energy and Environment, held a hearing titled "The Next Generation of Fusion Energy Research" on Thursday October 29, 10 AM to 12 noon in Room 2318 of the Rayburn House Office Building in Washington, DC.

The witnesses were:

**Edmund Synakowski**, Associate Director for Fusion Energy Sciences, DOE Office of Science  
**Stewart Prager**, Director, Princeton Plasma Physics Laboratory

**Thom Mason**, Director, Oak Ridge National Laboratory

**Riccardo Betti**, University of Rochester

**Raymond J. Fonck**, University of Wisconsin .

Information on the hearing is posted at [http://science.house.gov/publications/hearings\\_mar\\_kups\\_details.aspx?NewsID=2653](http://science.house.gov/publications/hearings_mar_kups_details.aspx?NewsID=2653)

A link on the right hand side labeled "Webcast" provides the actual webcast. Links on the left side provide the written testimonies provided by the Subcommittee chair, Brian Baird (D-WA) and the witnesses.

## DOE Awards \$8.2 Million to Rochester Center for 'Extreme Fusion'

The U.S. Department of Energy has awarded \$8.2 million to the University of Rochester to support its Fusion Science Center for Extreme States of Matter for another five years. The funding represents a 50 percent increase over the previous \$5.5 million grant, which founded the center in 2004.

Riccardo Betti, Chuang Ren and David Meyerhofer, professors of mechanical engineering and physics and astronomy, oversee the project, which makes use of the lasers at the University's Laboratory for Laser Energetics (LLE), including the new ultra-high-intensity laser beam lines of the Omega EP.

The fusion center helps physicists develop an understanding of extreme states of matter using new methods to achieve fusion. A new fusion scheme developed by the center makes use of a single laser operated in two different modes: a low-power mode to slowly compress the pellet, and a high-power

mode to drive a shock wave to ignite the hydrogen fuel inside the pellet.

The Rochester-led center involves the participation of MIT, General Atomics, the University of California at San Diego, Ohio State University, UCLA, University of Nevada at Reno and the University of Texas at Austin, and it includes collaboration with the Department of Energy's National Nuclear Security Administration programs at Rochester and Lawrence Livermore National Laboratory.

## \$9 M in HEDLP Grants Announced

The Department of Energy's (DOE) National Nuclear Security Administration (NNSA) and the DOE Office of Science announced that 23 research grants totaling \$9.9 million have been awarded as part of the High Energy Density Laboratory Plasmas (HEDLP) program.

The grants span work from astrophysics to laser plasma simulation and from electric magnetic field mapping to innovative ideas for inertial fusion energy. DOE's Office of Science and the NNSA provided \$6.5 million and \$3.4 million, respectively.

For more information on the program, please see <http://nnsa.energy.gov/dsup/>

## Moses, Betti Receive Teller Medals

Ed Moses (LLNL) and Ricardo Betti (U. Rochester) are the recipients of the 2009 Edward Teller Medal, sponsored by the American Nuclear Society. The medals were presented at the Sixth International Conference on Inertial Fusion Sciences and Applications (IFSA) in San Francisco on September 10.

Moses was cited for his "leadership in the development and completion of the National Ignition Facility" (NIF). As principal associate director for NIF and Photon Science at Lawrence Livermore (LLNL), Moses is leading an international effort to perform the first ignition experiments on NIF. He joined NIF in 1999 as a laser scientist and program manager of the AVLIS program after working on a number of laser research projects at Hughes Aircraft and LLNL. He led the development of the Peregrine radiation therapy planning tool for the treatment of cancer. He has overseen the construction of NIF, the world's largest and most energetic laser, and is gearing up for ignition experiments in 2010. Moses is a fellow of SPIE and the American Association for Advancement of Science. He is a member of the National Academy of Engineering. He received the 2008 Leadership Award from Fu-

sion Power Associates, the NNSA Defense Programs Award of Excellence, and the Memorial D. S. Rzhdestvensky Medal for lifetime contributions to laser and optical sciences.

Betti was cited for his "seminal contributions to the theory of hydrodynamic instabilities, implosion dynamics and thermonuclear ignition in inertial confinement fusion." A professor at the University of Rochester and director of the Fusion Science Center for Extreme States of Matter, Betti has devised new ignition concepts and theoretical models for inertial fusion implosions and scaling laws for ignition. These scaling laws are the basis for present experiments on the OMEGA laser and future research on NIF. Betti was elected fellow to the American Physical Society in 2001 and has served on a number of review, advisory and organizing committees. These include vice chair of the DOE Fusion Energy Science Advisory Committee and chair of the Plasma Science Committee of the National Academies.

Established in 1991, the Edward Teller Medal recognizes pioneering research and leadership in inertial fusion sciences and applications. The award, sponsored by ANS, is normally presented at IFSA during odd-numbered years, and consists of a silver medal embedded in a plaque and a \$2,000 monetary award. The medal is named in honor of the late Dr. Edward Teller, distinguished physicist, Director Emeritus of Lawrence Livermore National Laboratory and Senior Research Fellow at the Hoover Institution. Teller is recognized worldwide as a pioneer in inertial fusion sciences

Moses can be reached at [moses1@llnl.gov](mailto:moses1@llnl.gov)

Betti can be reached at [betti@me.rochester.edu](mailto:betti@me.rochester.edu)

## FPA Awards to Stacey, Lee, Garnier and Latkowski

Fusion Power Associates Board of Directors has announced the recipients of its Distinguished Career, Leadership, and Excellence in Fusion Engineering Awards.

### Distinguished Career Award

Weston M. Stacey, Jr., Callaway Regent's Professor of Nuclear Engineering at Georgia Institute of Technology, has been chosen by Fusion Power Associates (FPA) Board of Directors to receive the 2009 FPA Distinguished Career Award.

In selecting Prof. Stacey, the FPA Board recognizes his decades of outstanding career contributions to fusion research and development, including his pioneering contributions to power-producing fusion

reactor designs, to the INTOR design which was a forerunner for ITER, and to conceptual designs of fusion-fission systems.

FPA Distinguished Career Awards have been given annually since 1987 to individuals who have made distinguished lifelong career contributions to fusion development.

### Leadership Award

Dr. G. S. Lee, President of the Korean National Fusion Research Institute (NFRI) and former Director-General of the ITER Korean Domestic Agency, has been chosen to receive the 2009 FPA Leadership Award.

In selecting Dr. Lee, the FPA Board recognizes the leadership he has provided to the KSTAR tokamak project, to Korean participation in the ITER project, and his leadership of the International Fusion Research Council (IFRC).

FPA Leadership Awards have been given annually since 1980 to individuals who have shown outstanding leadership qualities in accelerating the development of fusion.

### Excellence in Fusion Engineering Award

Darren Garnier of Columbia University and Jeff Latkowski of Lawrence Livermore National Laboratory have been chosen to receive 2009 FPA Excellence in Fusion Engineering Awards.

In selecting Dr. Garnier, the FPA Board notes the contributions and leadership he has provided for the design, fabrication and operation of the Levitated Dipole Experiment (a joint Columbia-MIT project located at MIT) and his contributions to the diagnostics and control systems for that experiment.

In selecting Dr. Latkowski, the FPA Board notes the contributions and leadership he has provided for the LIFE fusion-fission project, the NIF Final Safety Analysis, and to LLNL contributions to the non-laser portions of the national High Average Power Laser (HAPL) program.

FPA Excellence in Fusion Engineering Awards, established in memory of MIT professor David J. Rose, have been given annually since 1987 to recognize individuals in the relatively early part of their careers who have shown both technical accomplishment and potential to become exceptionally influential leaders in the fusion field.

The Awards will be presented at Fusion Power Associates Thirty-year Anniversary Annual Meeting

and Symposium, December 2-3, in Washington, DC

A list of previous Award recipients is posted at <http://fusionpower.org> and click on Awards.

### Interview with Dick Post

21st Century Science and Technology magazine (Marje Hecht, editor) has published an extensive (16-page) interview, including pictures, with Livermore fusion pioneer Richard F. Post. The interview is titled "A Fusion Pioneer Talks About Fusion and How to Get There." The article can be accessed at:

[http://www.21stcenturysciencetech.com/Articles\\_2009/Summer-2009/Post\\_interview.pdf](http://www.21stcenturysciencetech.com/Articles_2009/Summer-2009/Post_interview.pdf)

The same issue includes the text of Dick's remarks at Fusion Power Associates December 2008 annual meeting and can be accessed at:

[http://www.21stcenturysciencetech.com/Articles\\_2009/Summer-2009/Thoughts\\_on\\_fusion.pdf](http://www.21stcenturysciencetech.com/Articles_2009/Summer-2009/Thoughts_on_fusion.pdf)

### Innovative Confinement Concepts Workshop

The Innovative Confinement Concepts Workshop (ICC2010) will take place February 16 to 19, 2010 at the Princeton Plasma Physics Laboratory in Princeton, New Jersey. Abstract submission, is handled through the website: <http://www.iccworkshops.org/icc2010/>

The abstract deadline is December 4, 2009.

The goal of the ICC program is to advance and broaden fusion science and related plasma science and to explore alternate approaches.

This workshop is for presentation of results and ideas about concepts that might make large steps towards practical fusion power, complementing the important feasibility steps of the International Thermonuclear Experimental Reactor (ITER), and the National Ignition Facility (NIF). The ICC experiments also complement the mainline concepts in the advancement of plasma science. These experiments test the general validity of plasma physics and technology in wider parameter regimes, develop new fusion plasma physics, and cross-fertilize with other fields of plasma science.

Participants are asked to categorize their presentations by the areas of advancement and the areas of related plasma science, which can be addressed by small plasma experiments. The categories for areas of advancement and of related plasma science are given on the website.

For further information contact Tom Jarboe:  
[jarboe@aa.washington.edu](mailto:jarboe@aa.washington.edu)

## Tore Supra Special Issue

As part of the tokamak special issue series, the American Nuclear Society journal Fusion Science and Technology (FS&T), edited by Nermin Uckan, has published a special issue devoted to Tore Supra (FS&T Vol.56, No.3, October 2009).

The nineteen chapters/papers included in the FS&T issue provide an overview of the Tore Supra (TS) scientific and technological achievements that cover the period of 20 years of TS operation from mid-1988 to early-2009.

FS&T has been working with the international tokamak groups to contribute to series of special issues to recognize and highlight the science and technology contributions to a next-step burning plasma device (ITER). The Tore Supra issue is the ninth in the FS&T series of tokamak experiments. The first eight were: JT-60 (2002), ASDEX-Upgrade (2003), FTU (2004), TEXTOR (2005), DIII-D (2005), JFT-2M (2006), Alcator C-Mod (2007), and JET (2008).

For further information on access to Tore Supra or other tokamak special issues, contact Nermin Uckan ([uckanna@ornl.gov](mailto:uckanna@ornl.gov)) or visit the FS&T journal site at <http://www.ans.org/pubs/journals/fst/> for table of contents and abstracts. Library/individual subscribers can access full electronic articles at <http://epubs.ans.org/>

## New Book on Nuclear Power and Fusion Published

A new book, Nuclear Reactors, Nuclear Fusion and Fusion Engineering, has been published by NOVA Science Publishers. The price is \$116.10 when purchase online at <https://www.novapublishers.com>

The book description provided by the publisher says: Nuclear reactors play a key role in 21st Century energy production. This new book provides critical research in both fission and fusion energy production as well as the technology of the reactors. The role of nuclear data in Accelerator Driven Systems in order to reduce the cost for reaching a certain level of safety is presented and a detailed discussion of turbulent mixing and void drift that includes state-of-the-art models is given. Motivation for construction of the fusion reactors, including the laser fusion facilities and other related problems, are addressed. A brief history of magnetic confinement fusion power plant conceptual

designs, focusing on tokamaks, is outlined in this book. Furthermore, the progress and state-of-the-art of principal aspects of fusion safety and environment are discussed. Since a high quality of vacuum integrity is required in large tokamak machines, leak detection systems are overviewed and a reasonable leak detection strategy is proposed.

The fusion portion of the Table of Contents is:

History and Evolution of Fusion Power Plant Studies: Past, Present, and Future Prospects  
(Laila A. El-Guebaly, Fusion Technology Institute, Univ. of Wisconsin, Madison, WI)

Optimization of Configuration Under Dominant Electron Heating in Tokamaks  
(Qingdi Gao, Southwestern Institute of Physics, Chengdu, China)

Impurity Radiation and Opacity Effects in Fusion Plasmas  
(D. Kh. Morozov, and V.E. Lukash, RRC Kurchatov Institute, Moscow, Russia)

Recent Developments in Safety and Environmental Aspects of Fusion Experiment and Power Plants  
(Laila A. El-Guebaly, Lee C. Cadwallader - Univ. of Wisconsin, Fusion Technology Institute, Madison, WI and others)

Leak Detection Technology  
(Seiji Hiroki, Tetsuya Abe Sadamitsu Tanzawa - Japan Atomic Energy Agency, Mukoyama, Naka-Shi, Ibaraki, Japan and others)

A D-3He Spherical Tokamak Reactor with the Plasma Current Ramp-up by Vertical Field  
(Osamu Mitarai - Liberal Arts Education Center, Tokai Univ., Toroke, Kumamoto, Japan)

## Interview with Dick Post

21st Century Science and Technology magazine (Marje Hecht, editor) has published an extensive (16-page) interview, including pictures, with Livermore fusion pioneer Richard F. Post. The interview is titled "A Fusion Pioneer Talks About Fusion and How to Get There." The article can be accessed at:

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### In Memoriam: Lew Hedrick, Jr.

Dr. Clyde Lewis "Lew" Hedrick, Jr. passed away September 19 in Oak Ridge, Tennessee, at the age of 69. For 25 years (1970 - 1995) he made many contributions to fusion research as a theoretical physicist working in the Fusion Energy Division at Oak Ridge National Laboratory.

Lew received his Ph.D. in Theoretical Plasma Physics from UCLA. He worked (1960-65) at the U.S. Naval Ordnance Test Station in Pasadena; taught at UCLA (1965-70) at UCLA; and then joined the fusion program in Oak Ridge. From 1995 until his retirement in 2001 he was an Engineering Analyst with Lockheed Martin Energy Systems in Oak Ridge. Hedrick Hall at UCLA is named in honor of his grandfather, Earl Hedrick, who was a professor and provost there.

An online guestbook may be signed and message of condolence posted at <http://www.weatherfordmortuary.com> Then click on "Obituaries" in the upper right hand corner.

### In Memoriam: Joe DiMarco

Joseph N. DiMarco, Ph.D., of Albuquerque passed away on October 4, 2009, at his home. He was born in New York City on September 28, 1935, and was married to Fran DiMarco for 46 years. He received a Doctorate in Physics from Stevens Institute of Technology. He joined the Los Alamos National Laboratory in the early 1960s and subsequently made numerous scientific contributions to many fusion experiments there, including the Stuffed Caulked Cusp and a series of successful toroidal pinch experiments. During his career, spanning more than three decades, he also worked on rail guns and magnetic dipoles and was a Fellow of the American Physical Society. He retired from the lab in 1993.

Condolences may be sent to his wife Fran at [frandimarco@msn.com](mailto:frandimarco@msn.com) .AOLWebSuite



Nov15-19 American Nuclear Society Winter Meeting. Washington, DC <http://www.ans.org>

Nov 25-27 International Conference on Frontiers in Diagnostics Technologies. Frascati, Italy. Contact: [orsitto@frascati.it](mailto:orsitto@frascati.it)

Nov 15-18 HEDLP Workshop. Rockville, MD. [http://www.ofes.fusion.doe.gov/HEDLP\\_Website/HEDLP\)ReNew.shtml](http://www.ofes.fusion.doe.gov/HEDLP_Website/HEDLP)ReNew.shtml)

Dec 1-4 Plasmas in the Laboratory and in the Universe: Interactions, Patterns, Turbulence. Como, Italy. Contact: [rome@mi.infn.it](mailto:rome@mi.infn.it)

Dec 2-3 Fusion Power Associates Thirty-year Anniversary Meeting and Symposium. Washington, DC. <http://fusionpower.org>

Dec 8-11 19<sup>th</sup> International Toki Conference. Gifu, Japan. <http://peras.nifs.ac.jp/itc19/center>

Jan 18-21 Workshop on Opportunities in Plasma Astrophysics. <http://mri.pppl.gov/WOPA-First-Announcement.html>

Feb 16-19 Innovative Confinement Concepts (ICC) Meeting. Princeton, NJ. Contact: [jarboe@aa.washington.edu](mailto:jarboe@aa.washington.edu)

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