

# Fun\* with Basic Accountancy

Rachael Livermore

\*Results may vary

# Why do I need to know how to keep financial records?

## Academia:

- Grants
- Conferences

## Real life:

- Taxes
- Understanding how well your business is doing
- Legal compliance
- Personal finance\*

\*I don't do this

# Generally Accepted Accounting Principles (GAAP)

Based on four assumptions:

- Accounting Entity
- Going Concern
- Monetary Unit Principle
- Time Period Principle

# Generally Accepted Accounting Principles (GAAP)

Four basic principles:

- Historical Cost Principle
- Revenue Recognition Principle  
(i.e. accrual-based accounting)
- Matching Principle
- Full Disclosure Principle

# Generally Accepted Accounting Principles (GAAP)

Five constraints:

- Objectivity
- Materiality
- Consistency
- Conservatism (prudence)
- Cost-benefit relationship

# Is Kirk or Spock in a better financial position?

Kirk

- \$500 in the bank
- Rent (\$1,000) already paid
- Credit cards maxed out
- Gets a Starfleet salary

Spock

- \$1,000 in the bank
- Rent (\$1,000) due tomorrow
- \$5k available on credit cards
- Left Starfleet to pursue Kolinahr

# Accounts

Note there were four types of things to consider:

- **Assets** (e.g. cash, but can also be stuff)
- **Liabilities** (debt)
- **Income** (e.g. salary)
- **Expenses** (e.g. rent)

Cash =/= Profit!

# The Accounting Equation

$$\text{Assets} - \text{Liabilities} = \text{Equity}$$

stuff you own                    stuff you owe                    Value of business



# Debits and Credits

Dr	Asset	Cr
Increases	Decreases	

Dr	Liability	Cr
Decreases	Increases	

Dr	Expense	Cr
Increases	Decreases	

Dr	Income	Cr
Decreases	Increases	

# Double-Entry Bookkeeping

Every action has an equal, opposite reaction.

For every **debit**, you must enter an equal **credit**.



	Debit	Credit
You get a \$10,000 loan		

	Debit	Credit
You get a \$10,000 loan		
Cash	10,000	
	Loan	10,000

		Debit	Credit
You get a \$10,000 loan			
Cash		10,000	
	Loan		10,000
You buy a (cheap!) spaceship			

		Debit	Credit
You get a \$10,000 loan			
Cash		10,000	
	Loan		10,000
You buy a (cheap!) spaceship			
Cash			8,000
	Spaceship	8,000	

		<b>Debit</b>	<b>Credit</b>
You get a \$10,000 loan			
Cash		10,000	
	Loan		10,000
You buy a (cheap!) spaceship			
Cash			8,000
	Spaceship	8,000	
You sell tickets to travel to the Martian colony			

		<b>Debit</b>	<b>Credit</b>
You get a \$10,000 loan			
Cash		10,000	
	Loan		10,000
You buy a (cheap!) spaceship			
Cash			8,000
	Spaceship	8,000	
You sell tickets to travel to the Martian colony			
Cash		7,000	
	Sales		7,000

		<b>Debit</b>	<b>Credit</b>
You get a \$10,000 loan			
Cash		10,000	
	Loan		10,000
You buy a (cheap!) spaceship			
Cash			8,000
	Spaceship	8,000	
You sell tickets to travel to the Martian colony			
Cash		7,000	
	Sales		7,000
You buy fuel for the trip			

		<b>Debit</b>	<b>Credit</b>
You get a \$10,000 loan			
Cash		10,000	
	Loan		10,000
You buy a (cheap!) spaceship			
Cash			8,000
	Spaceship	8,000	
You sell tickets to travel to the Martian colony			
Cash		7,000	
	Sales		7,000
You buy fuel for the trip			
Cash			2,000
	Fuel costs	2,000	

		<b>Debit</b>	<b>Credit</b>
You get a \$10,000 loan			
Cash		10,000	
	Loan		10,000
You buy a (cheap!) spaceship			
Cash			8,000
	Spaceship	8,000	
You sell tickets to travel to the Martian colony			
Cash		7,000	
	Sales		7,000
You buy fuel for the trip			
Cash			2,000
	Fuel costs	2,000	
<b>TOTAL</b>		<b>27,000</b>	<b>27,000</b>

# The Trial Balance

	Debit	Credit
<b>Assets</b>		
Cash	7,000	
Fixed assets	8,000	
<b>Liabilities</b>		
Loan		10,000
<b>Income</b>		
Sales		7,000
<b>Expenses</b>		
Fuel	2,000	
<b>TOTAL</b>	<b>17,000</b>	<b>17,000</b>

# Adjusting Entries

Adjusting entries are needed for accrual accounting to ensure income and expenses are recognized in the correct period.

- Prepayments (cash flow happens too soon)
- Accruals (cash hasn't flowed yet)

# Matching

Income and costs should always be matched to the period covered by the accounts.

	Debit	Credit
\$1,000 of tickets are for next year		
Sales	1,000	
Prepaid income		1,000

# The Trial Balance

	Debit	Credit
<b>Assets</b>		
Cash	7,000	
Fixed assets	8,000	
<b>Liabilities</b>		
Loan		10,000
Prepaid income		1,000
<b>Income</b>		
Sales		6,000
<b>Expenses</b>		
Fuel	2,000	
<b>TOTAL</b>	<b>17,000</b>	<b>17,000</b>

# Accounting for Stock

Let's say each ticket comes with a spacesuit.

	Debit	Credit
You buy 50 spacesuits for \$100 each		
Stock	5,000	
	Cash	5,000

# Accounting for Stock

Let's say each ticket comes with a spacesuit.

	Debit	Credit
You buy 50 spacesuits for \$100 each		
Stock	5,000	
		5,000
You have sold 6 tickets		
Stock		600
	600	

# The Trial Balance

	Debit	Credit
<b>Assets</b>		
Cash	7,000	
Fixed assets	8,000	
Stock	600	
<b>Liabilities</b>		
Loan		10,000
Prepaid income		1,000
<b>Income</b>		
Sales		6,000
<b>Expenses</b>		
Fuel	2,000	
<b>TOTAL</b>	<b>17,000</b>	<b>17,000</b>

# Depreciation

The spaceship cost you money and should be represented in your profit, but not all at once.

	Debit	Credit
Spaceship depreciation over 8 years		
Depreciation	1,000	
	Fixed assets	1,000

# The Trial Balance

	Debit	Credit
<b>Assets</b>		
Cash	7,000	
Fixed assets	7,000	
<b>Liabilities</b>		
Loan		10,000
Prepaid income		1,000
<b>Income</b>		
Sales		6,000
<b>Expenses</b>		
Fuel	2,000	
Depreciation	1,000	
<b>TOTAL</b>	<b>17,000</b>	<b>17,000</b>

# Debits and credits only have to be equal in value, not number

e.g. Let's pay off some of that loan

		Debit	Credit
Loan payment			
Cash			1,000
	Loan	900	
	Interest	100	

# The Trial Balance

	Debit	Credit
<b>Assets</b>		
Cash	6,000	
Fixed assets	7,000	
<b>Liabilities</b>		
Loan		9,100
Prepaid income		1,000
<b>Income</b>		
Sales		6,000
<b>Expenses</b>		
Fuel	2,000	
Depreciation	1,000	
Interest	100	
<b>TOTAL</b>	<b>16,100</b>	<b>16,100</b>

# Financial Statements

A set of financial statements consists of:

Balance Sheet

Profit & Loss Statement

Cash Flow Statement (sometimes)

# Financial Statements

A set of financial statements consists of:

Balance Sheet (what is your business worth?)

- Assets
- Liabilities
- Equity

Profit & Loss Statement

Cash Flow Statement (sometimes)

# Financial Statements

A set of financial statements consists of:

Balance Sheet (what is your business worth?)

- Assets
- Liabilities
- Equity

Profit & Loss Statement (are you making money?)

- Income
- Expenses

Cash Flow Statement (sometimes)

# Financial Statements

A set of financial statements consists of:

Balance Sheet

- Assets
- Liabilities
- Equity

Profit & Loss Statement

- Income
- Expenses

Cash Flow Statement (sometimes)

- Movement in cash

# The Balance Sheet

	Debit	Credit
<b>Assets</b>		
Cash	6,000	
Fixed assets	7,000	
<b>Liabilities</b>		
Loan		9,100
Prepaid Income		1,000
<b>Equity</b>		
Retained Earnings		2,900
<b>TOTAL</b>		<b>13,000</b>
		<b>13,000</b>

# The Profit & Loss

	Debit	Credit
<b>Income</b>		
Sales		6,000
<b>Expenses</b>		
Fuel	2,000	
Depreciation	1,000	
Interest	100	
<b>Profit/(Loss)</b>		<b>2,900</b>

Let's look at some more useful examples...

Bashfest '15 Accounts																					
Date	Description	Total	Assets			Liabilities		Income Registration	Expenses											Check	
			Cash	Credit card	Prepayments	Creditors	Accruals		Hotel	Airfare	Speakers' expenses	Reception	Dinner	Lunches & Breaks	Materials/Supplies	Posters	Wireless cards	Proceedings	T-shirts	Credit card fees	
04 Sep 15	Flights (all except Brad Tucker)	(6,227.00)																			
28 Sep 15	Brad Tucker flight (to be reimbursed)	(400.00)																			
28 Sep 15	Hotels	(4,279.95)																			
28 Sep 15	Poster stands	(205.00)																			
28 Sep 15	Registrations	525.00																			
28 Sep 15	Credit card fees	(18.38)																			
28 Sep 15	Wireless cards	(12.50)																			
14 Oct 15	Dinner	(5,353.20)																			
14 Oct 15	Reception	(3,102.80)																			
14 Oct 15	O's 10/19	(2,486.26)																			
14 Oct 15	O's 10/20	(2,008.96)																			
14 Oct 15	T-shirts	(598.29)																			
14 Oct 15	Proceedings	(1,715.00)																			
15 Oct 15	Lanyards	(189.44)																			
15 Oct 15	Badges	(92.44)																			
16 Oct 15	T-shirts - final	(10.50)																			
21 Oct 15	Dinner - final invoice	334.80																			
21 Oct 15	Final hotel cost	(48.80)																			
21 Oct 15	Final flight cost	44.15																			
11 Nov 15	Reception - final	318.80																			
12 Jul 16	Speaker reimbursements	(1,950.10)																			
12 Jul 16	O's 10/19 - final invoice	(32.45)																			
12 Jul 16	O's 10/20 - final invoice	.																			
13 Jul 16	Poster stands - final	(93.32)																			
13 Jul 16	Proceedings - final	.																			
		<b>(27,601.64)</b>	-	<b>506.63</b>	-	<b>(28,108.26)</b>	0.00	<b>(525.00)</b>	<b>4,328.75</b>	<b>6,582.85</b>	<b>1,950.10</b>	<b>2,784.00</b>	<b>5,018.40</b>	<b>4,527.67</b>	<b>281.88</b>	<b>298.32</b>	<b>12.50</b>	<b>1,715.00</b>	<b>608.79</b>	<b>18.38</b>	-

## Bashfest '15 Profit & Loss

Description	Dr	Cr
<b><u>INCOME</u></b>		
Registration		525.00
	525.00	
	<b>TOTAL INCOME</b>	<b>525.00</b>
<b><u>EXPENSES</u></b>		
<b>Direct</b>		
Hotel	4,328.75	
Airfare	6,582.85	
Speakers' expenses	1,950.10	
Reception	2,784.00	
Dinner	5,018.40	
Lunches & Breaks	4,527.67	
Wireless cards	12.50	
T-shirts	608.79	
	<u>25,813.06</u>	
<b>Overheads</b>		
Materials/ Supplies	281.88	
Posters	298.32	
Proceedings	1,715.00	
Credit card fees	18.38	
AV	-	
	<u>2,313.58</u>	
	<b>TOTAL EXPENSES</b>	<b>28,126.64</b>
	<b>TOTAL</b>	<b>28,126.64</b>
		525.00
		<b>(27,601.64)</b>
<b>NET SURPLUS/ (LOSS)</b>		

# Bashfest '15 Balance Sheet

Description	Dr	Cr
<b>ASSETS</b>		
Cash	-	
Credit card	506.62	-
Prepayments	-	
<b>TOTAL ASSETS</b>	<u>506.62</u>	
<b>LIABILITIES</b>		
<b>Creditors</b>		
Creditors	28,108.26	
Accruals	(0.00)	
<b>TOTAL LIABILITIES</b>	<u>28,108.26</u>	
<b>EQUITY</b>		
Retained earnings	(27,601.64)	
<b>TOTAL</b>	<u>506.62</u>	<u>506.62</u>

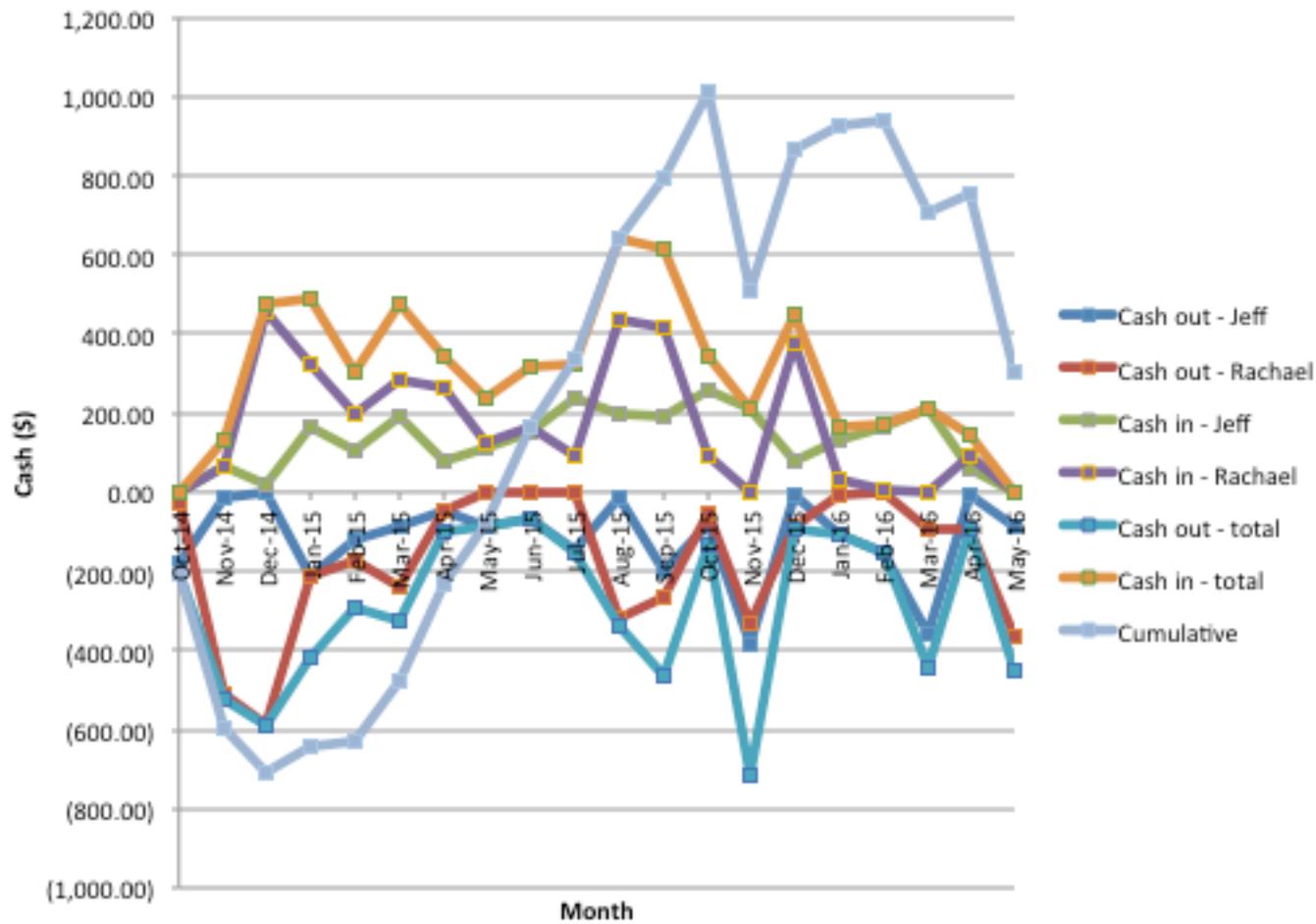


## Astronomy on Tap ATX Balance Sheet

Description	Dr	Cr
<b>ASSETS</b>		
Cash	-	
Credit card	-	
<b>Stock</b>		
Stickers	0.01	
Buttons	14.72	
Koozies	-	
Shirts	206.71	
Glasses	98.36	
<b>TOTAL ASSETS</b>		<u>319.80</u>
<b>LIABILITIES</b>		
<b>Creditors</b>		
Jeff	(292.70)	
Rachael	(11.20)	
<b>TOTAL LIABILITIES</b>		<u>(303.90)</u>
<b>EQUITY</b>		
Retained earnings	623.70	
<b>TOTAL</b>		<u>319.80</u> <u>319.80</u>

		Cash out		Cash in		Total out	Total in	Net	Cumulative
		Jeff	Rachael	Jeff	Rachael				
Total		(2,342.88)	(3,413.56)	2,635.58	3,424.76	(5,756.44)	6,060.34	303.90	4,384.47
Oct-14		(178.24)	(29.77)	1.00	1.00	(208.01)	2.00	(206.01)	(206.01)
Nov-14		(11.06)	(512.26)	65.00	68.00	(523.32)	133.00	(390.32)	(596.33)
Dec-14		0.00	(586.98)	22.00	453.20	(586.98)	475.20	(111.78)	(708.11)
Jan-15		(210.78)	(209.79)	166.00	323.00	(420.57)	489.00	68.43	(639.68)
Feb-15		(120.00)	(174.35)	105.00	201.00	(294.35)	306.00	11.65	(628.03)
Mar-15		(87.24)	(238.49)	194.34	281.78	(325.73)	476.12	150.39	(477.64)
Apr-15		(47.43)	(50.00)	76.96	265.00	(97.43)	341.96	244.53	(233.11)
May-15		(87.11)	0.00	111.50	125.50	(87.11)	237.00	149.89	(83.22)
Jun-15		(68.00)	0.00	150.00	164.68	(68.00)	314.68	246.68	163.46
Jul-15		(147.99)	(3.00)	235.32	91.00	(150.99)	326.32	175.33	338.79
Aug-15		(15.19)	(319.75)	200.60	437.68	(334.94)	638.28	303.34	642.13
Sep-15		(197.00)	(263.79)	194.52	418.92	(460.79)	613.44	152.65	794.78
Oct-15		(80.00)	(52.20)	257.44	89.00	(132.20)	346.44	214.24	1,009.02
Nov-15		(382.87)	(332.53)	214.17	0.00	(715.40)	214.17	(501.23)	507.79
Dec-15		(5.00)	(86.40)	78.42	374.00	(91.40)	452.42	361.02	868.81
Jan-16		(103.87)	(5.00)	132.55	33.00	(108.87)	165.55	56.68	925.49
Feb-16		(154.60)	0.00	161.54	8.00	(154.60)	169.54	14.94	940.43
Mar-16		(357.00)	(90.42)	213.26	0.00	(447.42)	213.26	(234.16)	706.27
Apr-16		(4.50)	(92.00)	55.96	90.00	(96.50)	145.96	49.46	755.73
May-16		(85.00)	(366.83)	0.00	0.00	(451.83)	0.00	(451.83)	303.90

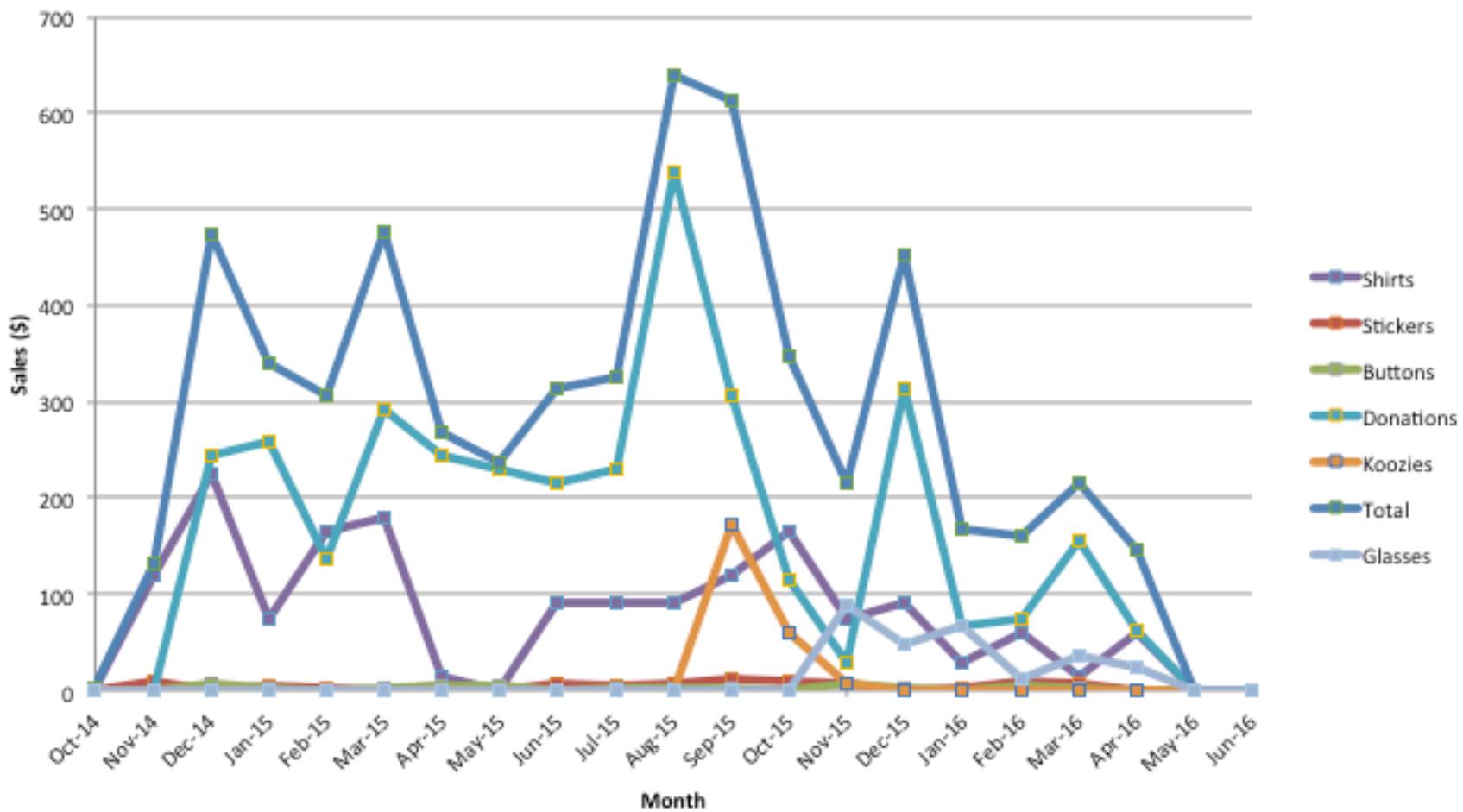
## Cash flow



## Astronomy on Tap ATX Profit & Loss

Description	Dr	Cr
<b>INCOME</b>		
<b>Merchandise</b>		
Stickers	91.00	
Buttons	48.00	
Koozies	240.00	
Shirts	1,665.00	
Glasses	276.00	
	2,320.00	
Donations	3,513.85	
		<b>TOTAL INCOME</b>
		<b>5,833.85</b>
<b>EXPENSES</b>		
<b>Direct</b>		
Merchandise	1,921.84	
Speakers	1,379.27	
Prizes	117.44	
	3,418.55	
<b>Overheads</b>		
Advertising	155.41	
Finance	35.90	
Hardware	1,478.30	
Sundry	121.99	
	1,791.60	
		<b>TOTAL EXPENSES</b>
		<b>5,210.15</b>
		<b>TOTAL</b>
	<b>5,210.15</b>	<b>5,833.85</b>
		<b>NET SURPLUS/ (LOSS)</b>
		<b>623.70</b>

## Income by Month



# Easy way to manage grants...

Rachael Livermore Budget																
Date	Description	Total	Account						Income			Expenses				
			Steve Startup	Steve NASA	Computer fund	HST	NASA			Steve startup	NASA	HST	Conferences	Observing	Hardware	Overheads
26 Aug 13	Startup	13,000.00	10,000.00		3,000.00					(13,000.00)						
26 Aug 13	CANDELS meeting	(1,349.12)	(1,349.12)		(2,378.00)						1,349.12					
26 Aug 13	Computer	(2,378.00)										2,378.00				
09 Nov 13	MOSFIRE	(1,417.02)		(1,417.02)												
09 Dec 13	Texas Symposium	(1,356.64)	(1,356.64)		(650.88)											
03 Feb 14	McDonald	(650.88)														
18 Feb 14	DEIMOS	(1,750.11)		(1,750.11)												
12 Mar 14	MOSFIRE	(2,668.53)		(2,668.53)												
05 Jun 14	Edinburgh	(2,264.45)														
23 Jun 14	McDonald	(815.88)	(815.88)													
27 Jul 14	CANDELS meeting	(541.53)	(541.53)													
05 Aug 14	Laptop & hard drives	(2,819.08)	(2,197.08)		(622.00)											
01 Sep 14	Steve startup	10,000.00	10,000.00													
30 Sep 14	NASA/DEIMOS	12,258.00	(926.61)													
01 Oct 14	Keck Science Meeting	(926.61)														
18 Oct 14	DEIMOS	(1,431.95)	(926.61)													
18 Oct 14	DEIMOS-Intae	(1,225.33)														
11 Nov 14	Yale HFF meeting	(1,363.81)	(1,363.81)													
15 Jan 15	McDonald	(842.62)	(842.62)													
20 Feb 15	Sesto Frontier Fields meeting	(3,158.77)		(3,158.77)												
18 May 15	McDonald	(839.68)	(839.68)													
06 Jun 15	Kruger meeting	(2,813.54)														
15 Aug 15	IAU	(4,205.06)	(4,205.06)													
01 Sep 15	Steve startup	10,000.00	10,000.00													
27 Sep 15	BAT meeting	(130.24)	(130.24)													
02 Jan 16	AAS (incl. AAS membership)	(2,367.08)	(2,367.08)													
04 Feb 16	McDonald	(1,012.93)	(1,012.93)													
06 Mar 16	Aspen	(2,116.78)	(2,116.78)													
16 Jul 16	Malta	(3,786.36)	(3,786.36)													
01 Sep 16	HST Archival Grant	118,601.00				118,601.00										
		119,627.00	74.48	(5,835.66)	-	118,601.00	407.72	250.46	6,129.00	(33,000.00)	(6,129.00)	(118,601.00)	26,379.99	12,654.93	5,197.08	6,742.00

